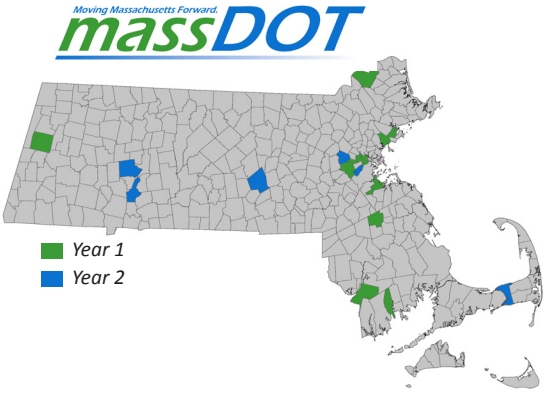
Walk/Bike Assessment

Main Street

Northampton, MA

January 18, 2016

Prepared for the Massachusetts Department of Transportation Bicycle and Pedestrian Safety Awareness and Enforcement Program



Bicycle and Pedestrian Infrastructure Assessments Northampton, MA

Main Street Corridor: Elm/West/State/New South Streets to King/Pleasant Streets (Rt. 5)

Northampton is one of 18 communities participating in the MassDOT multi-disciplined program to improve bicycle and pedestrian safety in Massachusetts. One of the components of the MassDOT program is to conduct walk and bike assessments that identify infrastructure challenges to biking and walking, and recommend short- and long-term improvements. These assessments are also a means of building local knowledge of the importance of well-designed bicycle and pedestrian facilities. WalkBoston and MassBike conducted an assessment of Main Street in downtown Northampton.

Pedestrian Improvements

Corridor-wide Recommendations

1. Narrow Main Street to shorten crossing distances by installing curb bump-outs and pedestrian refuge islands. The streetscape design needs to accommodate people using transit, riding bicycles, walking, and driving cars.
2. Improve sight distance for pedestrians by removing parking with 20 feet of crosswalks.
3. Evaluate signal timing for consistent pedestrian phasing and upgrade pedestrian signal equipment to include countdown indications and accessible pedestrian signals (APS).
4. Enforce ordinances that keep sidewalk walking zones clear. Educate business owners and event promoters about appropriate location of signage and tables.
5. Upgrade all curb ramps and install detectable warning strips to comply with accessibility requirements on all sidewalks along the corridor.

Pedestrian activity in the crosswalk across Main Street at Center Street

Bicycle Improvements

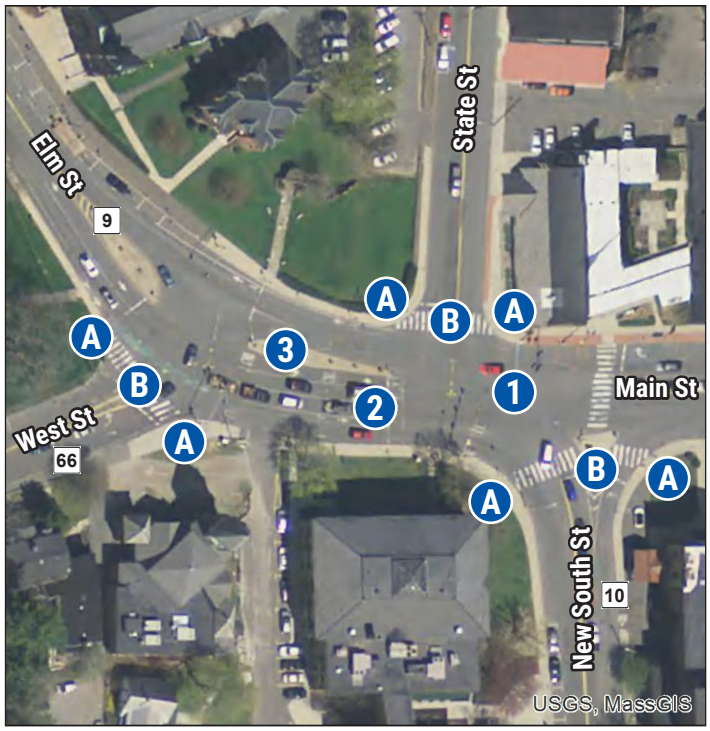
Corridor-wide Recommendations

1. Install bike facilities on Main Street through the study area. In the short-term, this may be accomplished as a retrofit project using signs and striping. In the long-term, this should be included as part of a full reconstruction of Main Street to provide physically separated bike lanes.
   - Alternative 1: Separated bike lane between angled parking and the curb.
   - Alternative 2: Bike lane between parking and the travel lanes, including a conversion to back-in angle parking.
2. Implement a truck restriction on Main Street through downtown.
3. Install wayfinding signage to New Haven Northampton Canal Line multi-use trail and other points of interest.
4. Install bike parking in convenient, secure, and visible locations throughout the Main Street corridor.

Bicyclist negotiating Main Street in Northampton, MA

in partnership with Toole Design Group, walkBoston, MassBike

Main Street: West Street to Crafts Avenue



Elm/West/State/New South Intersection

Priority Improvements

Short-term:

1. Restripe the existing diagonal crosswalk at State Street.
2. Repaint bike boxes and dashed bike lane through the intersection with green paint. Install two-stage turn queue boxes to improve safety for bicyclists turning to and from the side streets.
3. Install flashing yellow arrow signal phasing at West Street to clarify for drivers the need to yield to oncoming traffic (including bikes) when turning left from Main Street onto West Street.

Long-term:

A. Reduce corner radii at all corners. Reconstruct the southeast corner of the intersection with New South Street to remove the channelized right turn island.

B. Construct protected intersection geometry for through bicyclists and implement dedicated bike signalization for bicyclists to safely cross the intersection before motorists.

Cracker Barrel Alley/Crafts Ave Intersection

Priority Improvements

Short-term:

1. Remove parking spaces within 20 feet of crosswalks to improve sight distances at City Hall and at Cracker Barrel Alley.

Long-term:

A. Reconstruct Main Street to provide curb geometry on the south side of the roadway that matches the curvature of the roadway. Reduce size of curb radius onto Craft Avenue.

B. Close Cracker Barrell Alley to vehicular traffic to reduce conflicts with pedestrians on the sidewalk and allow the realignment of the crosswalk in front of City Hall.

C. Construct curb extensions and install a pedestrian refuge island to shorten crossing distance from City

Main Street: Old South Street to Pleasant Street

Old South Street to Gothic Street

Priority Improvements

Short-term:

1. Remove the angle parking spaces on both sides of Main Street adjacent to the crosswalk east of Old South Street to improve sight distance to the crosswalk and prevent drivers from backing into the crosswalk.
2. Consider temporary curb extensions using paint and bollards or flex posts to shorten pedestrian cross-times at both the mid-block and Center Street crossings.

Long-term:

A. Install curb extensions at the mid-block and Center Street crossings.

B. Consider extending the pedestrian refuge island to the Center Street crosswalk.

King/Pleasant Street Intersection

Priority Improvements

Short-term:

1. Install full radius corner ramps to allow for diagonal pedestrian crossing.
2. Update signal clearance times to allow for diagonal pedestrian crossing. Consider "pedestrian scramble" pavement markings to facilitate diagonal movement.
3. Upgrade the intersection to provide bicycle facilities to accommodate through bicyclists. Provide two-stage turn queue boxes to accommodate turning bicyclists.
   - Alternative 1: Protected intersection geometry connecting with a proposed separated bike lane.
   - Alternative 2: Through bike lane treatment connecting with a proposed bike lane.

Long-term:

A. Upgrade the signal to provide APS equipment and pedestrian countdown indications.

B. Reconstruct the intersection to provide a raised table and/or protected intersection to improve access and crossing for both pedestrians and bicyclists.

WalkBoston and MassBike conducted an assessment of pedestrian and bicycle infrastructure along Main Street in the City of Northampton on October 23, 2015. The assessment focused on Main Street (Route 9) through downtown Northampton. The study area included the downtown corridor between the signalized intersections of Main Street at West Street (Route 66) and Main Street at Pleasant Street/King Street (US Route 5). The assessment was conducted in October in order to capture conditions during which the local colleges were in session, when walking behaviors were highest, and to capture the behaviors of the wide variety of users.

Key Findings

During the Main Street assessment, several key themes were repeated from members of the assessment team. Team members praised the high quality walking environment through downtown Northampton, noting the vibrant street activity and wide comfortable sidewalks separated from traffic by parking. It was repeatedly noted however that crossing Main Street can be difficult given the wide street section, which exceeds 100 feet curb to curb in some locations. Other issues that make crossing difficult include multiple undefined lanes and poor sight distance resulting from adjacent parked cars. The crash data supports these observations, indicating multiple crashes involving pedestrians as well as rear-end crashes resulting from vehicles yielding at the crosswalks. To address these concerns, the team's key recommendations include reducing the length of crosswalks through roadway narrowing, curb extensions, and refuge islands; improving sight distance through the removal of key parking spaces; improving accessibility at intersections; and upgrading pedestrian signal equipment at signalized intersections.

Team members noted that access to and from downtown via bicycle is served by New Haven and Northampton Canal Line Rail Trail that provide excellent access from neighborhoods northeast and southwest of downtown, as well as bike lanes on Elm Street (Route 9) to the west and South Street to the southwest. No bike facilities are provided within the study area and crash data indicated several bike crashes including one fatality at the Pleasant Street/King Street intersection. Members of the team observed that the wide undefined travel lanes, head-in angle parking, and complex intersections are challenging for people on bikes. It was also noted that there is insufficient bike parking throughout the study area, as multiple bikes were observed locked to railings and sign posts. To address these issues, key recommendations include narrowing the roadway to provide separated bike lanes; installing bike parking; and upgrading intersections to provide enhanced bicycle treatments and/or protected intersection treatments.

Summary of MassDOT Bicycle and Pedestrian Safety and Awareness Program

The City of Northampton is one of the 18 communities participating in the Massachusetts Department of Transportation's (MassDOT) multi-disciplined program to improve bicycle and pedestrian safety in Massachusetts in 2015. One of the components of the MassDOT program is to conduct walk and bike assessments. The assessments have three goals:

1. Foster an awareness of the infrastructure elements which contribute to the biking and walking environment;
2. Evaluate the safety and quality of the biking and walking environment along the route; and
3. Recommend short and long-term infrastructure improvements.

The assessments are not meant to be a complete inventory of infrastructure deficiencies, nor are they meant to provide specific designs for every improvement. WalkBoston and MassBike lead the assessments as a means to build local capacity for improving the built environment for walking and biking. This report may be used as a resource for municipal staff, traffic engineers, and design professionals who municipalities may engage to design and implement policies, programs, and infrastructure improvements.

The Northampton Police Department received a grant to conduct enforcement and awareness activities at specific intersections and along identified corridors known to have high incidences of bicycle and pedestrian crashes or violations. Police Officers are stopping all road users (drivers, bicyclists, and pedestrians) who are engaging in dangerous behaviors for three reasons:

1. To inform the road user of the rules of the road;
2. To determine if there is a built environment (or infrastructure) reason that someone is not following the rules; and
3. To gather qualitative data about the reasons why people are behaving the way they are.

The data collected from the police coupled with the results of the infrastructure assessments will identify deficiencies and propose recommendations to improve the safety and quality of the walking and biking environment in Northampton.

Toole Design Group (TDG) is working with WalkBoston and MassBike to complete the assessment reports. TDG prepared this report which summarizes the observations made by members of the assessment team and makes recommendations for improvements to the built environment to increase walkability and bikeability. The observations vary from specific infrastructure deficits, such as faded crosswalks or uneven sidewalks, to general comments on traffic speeds or land use patterns (e.g., vacant storefronts). Likewise, the recommendations range from specific fixes (e.g., paint crosswalk) to suggestions for further study (e.g., evaluate the feasibility of installing raised crosswalks) to non-infrastructure items such as education and enforcement.

Assessment Team

Representatives from the City of Northampton, MassDOT, Pioneer Valley Planning Commission, Healthy Hampshire, Massachusetts Department of Public Health, WalkBoston, MassBike, and TDG participated in this assessment. The members and their affiliations are provided in **Table 1**.

Table 1 - Assessment Team

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Assessment Location

WalkBoston, MassBike, and MassDOT met with representatives from the City of Northampton to identify and choose appropriate locations for the walk and bike assessments funded through this MassDOT safety program. The starting points for identifying the proposed locations included the Highway Safety Improvement Program Top five percent high-crash clusters involving bicycle and pedestrian-related fatalities and injuries, and the locations selected by the Northampton Police Department for awareness and enforcement activities under this program; **Figure 1** illustrates these locations. One of the goals of this program is to identify if the built environment or infrastructure is contributing to the high incidence of crashes and/or bad behavior in the described locations.

Figure 1 - Assessment Area Map

The discussions quickly centered on the challenges bicyclists and pedestrians face on Main Street, especially for bicyclists and crossing pedestrians. While the area as a whole has excellent bicycling and walking infrastructure, there are safety issues at some of the intersections and within the roadway. The high-crash cluster analysis revealed that the Main Street corridor experiences a very high rate of crashes; the corridor includes three crash clusters:

- 2012 HSIP Pedestrian Cluster - Main Street in the study area and segments of King/Pleasant Street;
- 2012 HSIP Bike Cluster - Main Street in the study area plus a segment of Pleasant Street; and
- 2012 Top 200 Intersection Cluster - Ranked 92 - Main Street from Center Street to Market Street.

With the goal of improving safety in Northampton, Main Street was selected for this assessment. The limits of the area analyzed during the assessment begin at the West Street (Route 66) intersection to the west and terminate at the Pleasant Street/King Street (US Route 5) intersection to the east. The Main Street corridor was the subject of a design charrette run by Nelson/Nygaard in March, 2011. The study discussed three major concerns which continue to be relevant today:

- Wide 4-lane cross-section;
- Large intersections with long crossing distances; and
- Inhospitable biking environment.

The proposed solutions included creating a bike boulevard, installing reverse angle parking, and widening sidewalks. These ideas continue to be discussed among City staff and were considered during the assessment. In 2013, the Main/Elm/State/New South/West Street intersection received approval for federal aid highway funding in excess of $1 million. The City is rethinking their proposal and considering resubmitting for additional funding to address the issues that are corridor-wide. There is some hesitancy to implement short-term solutions, such as curb extensions or travel lane adjustments, just to remove them once a clear vision for the Main Street corridor is fully formed. This assessment is a means of soliciting new ideas and validating previously submitted ones to build a safer Main Street for people walking, riding bikes, and driving.

While bike and walk assessments are often conducted independently, the Northampton representatives felt that a complete streets approach – that is looking at the patterns of all road users – would be most appropriate at this location and consistent with the Northampton Complete Streets policy, adopted in 2005. Therefore, this report addresses both pedestrian and bicycle accommodations.

The assessment was conducted on Friday, October 23, 2015, and took approximately three hours. Before the assessment, WalkBoston and MassBike presented an introduction about the assessment process and a brief summary of pedestrian and bicycle infrastructure. The group spent about an hour and a half in the field and regrouped for a discussion of observations and potential recommendations.

During the assessment, the topics covered included the potential for narrowing and reducing the number of travel lanes, calming traffic, providing improved accessibility at intersections, providing improved crossing opportunities throughout the corridor through narrower lanes and improved sight distance, and providing bicycle facilities and bike parking through downtown. The following section describes both the observations and recommendations by location. The locations include area-wide recommendations as well as location specific recommendations.

Main Street Corridor Assessment

The study area for the Main Street assessment shown in **Figure 1** includes Main Street from West Street (Route 66) to King Street/Pleasant Street (US Route 5), including the following intersections:

- Main Street/Elm Street (Route 9) at West Street (Route 66);
- Main Street at State Street/New South Street (Route 10);
- Main Street at Masonic Street;
- Main Street at Crafts Ave/Crackerbarrell Alley;
- Main Street at Old South Street;
- Main Street at Center Street;
- Main Street at Gothic Street; and
- Main Street at King Street (Route 10, US Route 5)/Pleasant Street (US Route 5).

Main Street is a City-owned roadway classified by the MassDOT Office of Transportation Planning as a principal arterial, and carries state numbered routes 9 and 10 through downtown. Route 9 is a major east-west connector across the state, beginning to the west in Pittsfield and terminating to the east in Boston. Locally, Route 9 provides access to Williamsburg to the northwest and Hadley to the east. Within the study area, the roadway provides a wide cross-section with undefined lanes, on-street parking, and a posted speed limit of 25 miles per hour. Drivers typically form two lanes in each direction through the study area. Route 10 is a north-south route, connecting to Connecticut and Vermont, roughly paralleling I-91.

Corridor-wide Observations and Recommendations

The team noted that sidewalks throughout the study area are generally wide and in good condition. Pedestrian volumes and activity along the sidewalks is busy, and pedestrians are frequently observed crossing the roadway both within and outside of the marked crosswalks. Outdoor dining is encouraged and occurs often along Main Street, which adds to the vibrancy of the area. Many establishments encroach on the walking zone of the sidewalk despite the ordinances which regulate appropriate dining areas. Sandwich boards and other temporary signage also interrupt the sidewalk, which may be just an annoyance for some, but a barrier for others. The team noted that more needs to be done to ensure that the walking zone remains free of obstructions.

Travel speeds through downtown generally appear to be at or below the speed limit, and most drivers were observed to yield at uncontrolled crosswalks. The team noted several issues, however, with crosswalks in general through downtown, including pedestrian ramps which do not meet accessibility standards, wide crossings that result in difficulty for disabled pedestrians, cars parked adjacent to crosswalks obstruct visibility to pedestrians waiting to cross, and multiple lanes create multiple-threat scenarios for crossing pedestrians. Members of the team observed that some drivers in the second travel lane did not stop when the driver in the first lane had stopped, as they may have thought the stopped vehicle was waiting to park.

Members of the team suggested narrowing the roadway to provide one consistent travel lane throughout the study area, plus turn lanes at key intersections as needed. Parking should be removed adjacent to all crosswalks (within 20 feet) in order to maintain safe sight distance between pedestrians and vehicles. As a long term measure, constructing curb extensions at each crosswalk will further enhance sight distance for all users. Pedestrian crossing islands should also be considered at major mid-block crossings.

Pedestrian signal phasing is inconsistent throughout the Main Street corridor. Some signals are concurrent, others are exclusive. Some signals are activated with pedestrian push buttons, others are not. For those who live in Northampton, these details are known, but for visitors, vehicular traffic movements are unpredictable and potentially dangerous, as pedestrians may not expect different operations between adjacent intersections. As the traffic signal equipment is upgraded, pedestrian countdown signals with Accessible Pedestrian Signals (APS) should be installed and the consistency of phasing should be studied.

Members of the team noted that most of the pedestrian ramps within the study area do not meet accessibility standards. The City should reconstruct the curb ramps as part of ongoing maintenance work to provide compliant ramps including appropriate level landing areas and detectable warning surfaces.

Members of the team observed several large tractor trailer trucks and logging trucks traveling through downtown which did not appear to be local trips. City staff noted that large vehicles typically have to detour up King Street to Damon Road in order to avoid the low railroad bridge east of King Street and continue east on Route 9 towards Interstate 91. Given that the existing through route is extremely indirect and that the heavy truck volumes are incompatible with the heavy volumes of people walking and on bikes, the City and MassDOT should explore strategies to reroute through trucks away from Main Street through downtown. It would be necessary to provide a sufficient alternate route for through trucks on Route 9.

Figure 2 - Logging trucks pass through the New South Street intersection on Main Street.

The team also noted that no dedicated bike facilities are provided on Main Street east of New South Street, however bicyclists were observed traveling on the roadway and on the sidewalk. Many bikes were observed locked to bike racks, railings, and signs. Members of the team suggested installing bike lanes or separated bike lanes as part of the previously proposed travel lane reduction. Separated bike lanes may be provided at low cost by shifting the parking away from the curb, providing a bike facility along the curb line separated from traffic by the parked cars. If bike lanes are proposed between the parking and travel lanes, the angle parking should be reversed to provide back-in parking to provide safe sight distance between drivers exiting spaces and bicyclists in the bike lane. The team discussed the previous trial that Northampton conducted for reverse angle parking in which drivers did not understand how to properly utilize the spaces. Members of the team noted that if reverse angle parking is implemented, it must be provided for all angle parking spaces in order to minimize confusion.

Lastly, members of the team noted that access routes to and from the nearby trail network were not clearly marked, and that cyclists and pedestrians may not be aware of the best routes to and from downtown. The City should consider installing wayfinding signage at key locations on and near Main Street as well as on the trails to direct users to and from the trails.

Short-term Recommendations:

- Remove parking adjacent to crosswalks to improve sight distance.
- Reduce the number of travel lanes on Main Street to provide a single lane in each direction plus turn lanes at key intersections to minimize queueing.
- Install bike facilities on Main Street through the study area.
    - Alternative 1: Separated bike lane between the existing angled parking spaces and the curb.
    - Alternative 2: Bike lane between parking and the travel lanes including a conversion to back-in angle parking.
    - Alternative 3: Two-way center running separated bike lane (cycle track) including left turn restrictions at side streets.
- Install bike parking in convenient and visible locations throughout the study area.
    - Single bike racks should be placed frequently within the furniture zone on sidewalks. Racks should be placed such that locked bicycles do not obstruct the sidewalks or adjacent parking stalls.
    - High capacity, covered bike parking should be located in a secure, visible location.
- Reconstruct curb ramps to meet accessibility standards.
- Enforce ordinances that keep the sidewalk walking zones clear. Educate business owners about appropriate locations for signage, seating, and other items placed on sidewalks.
- Install bike wayfinding signage directing bicyclists to access points for the adjacent trail network.
- Install pedestrian countdown timer indications and accessible pedestrian signals (APS).
- Revise signal timing to provide consistent pedestrian timing at all signalized intersections where possible.

Long-term Recommendations:

- Construct curb extensions and consider constructing pedestrian crossing islands at all unsignalized crosswalks.
- Construct street or sidewalk level separated bike lanes (cycle tracks) with curb separation from adjacent parking. If separated bike lanes are constructed at sidewalk level, there must be horizontal separation between the bike lane and the sidewalk. The horizontal separation strip needs to include vertical elements, such as street lights, trees, signs, benches, etc, to ensure that bikes and pedestrians remain separated.
- Implement a truck restriction on Main Street through downtown while maintaining local truck access. This will require that the City develop an alternate route for through trucks on Route 9. A truck restriction will require approval from MassDOT.

Intersections: Main Street/Elm Street at West Street and at State Street/New South Street

Existing Conditions

Elm Street/Main Street at West Street and Main Street at State Street/New South Street is a dual intersection controlled by two traffic signals. Main Street is aligned on a curve through the intersection with a significant down grade from west to east. The traffic signal provides a complex signal phasing scheme including a protected left turn phase from Main Street to State Street, a protected plus permitted left turn phase from Main Street to West Street, and concurrent pedestrian phases.

Figure 3 - A bicyclist passes through the New South Street intersection on Main Street.

Members of the team noted that the diagonal crosswalk across the State Street intersection has faded and not been replaced, however, pedestrian signal equipment provides a protected phase concurrent with the Main Street Street left turn phase. Members of the team noted that no crosswalk is provided across Main Street on the west side of State Street or on either side of West Street.

Bike lanes are provided on Elm Street west of State Street/New South Street. The eastbound bike lane includes green paint through the intersection of West Street to highlight the conflict zone. Members of the team noted that eastbound vehicles on Main Street that plan on turning right at New South Street frequently transition through the bike lane over a long distance due to the road alignment and curvature, creating a large conflict zone. The eastbound approach to State Street/New South Street also provides a bike box across all four lanes, however, the markings are faded.

Figure 4 - Bike lane intersection markings transition through the West Street intersection.

Crash data indicate that there were three pedestrian involved crashes at the intersections during the period analyzed, all of which involved pedestrians in the crosswalks. There were also three bicycle involved crashes during the period analyzed, each involving a turning vehicle and a bicycle. All of the pedestrian and bicycle involved crashes resulted in injuries.

Observations and Recommendations

Members of the team noted that the curvature of the roadway through the West Street intersection and the angle of the West Street approach may confuse some left turning drivers and lead them to believe they have the right-of-way through the intersection. The City should consider extending the median and modifying the curb geometry through the intersection to better define the yield point for left turning vehicles. The City should also consider providing flashing yellow arrow indications for the left turn movement during the permissive turn phase to further inform drivers to yield when turning.

Members of the team noted that no crosswalks are provided west of New South Street until Bedford Terrace, west of the study area. The City should consider installing crosswalks, ramps, and pedestrian signals across Main Street at one or both corners of West Street in order to serve pedestrians who wish to cross between destinations on West Street and on the north side of Main Street. The City should also restripe the existing diagonal crosswalk across Main Street at State Street.

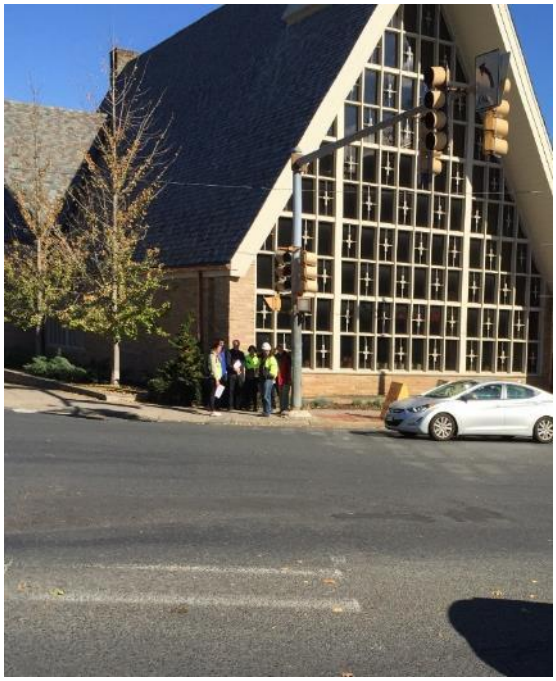


Figure 5 - Faded diagonal crosswalk at New South Street.

Members of the team also noted that vehicles turning right from Main Street at New South Street often make the movement at a high speed during the concurrent pedestrian phase due to the large curb radius and wide cross-section of both roads. City staff noted that a dynamic "YIELD TO PEDESTRIANS" sign has previously been operated at this location, however, was deactivated due to traffic congestion issues. The City should consider reconstructing the southwest corner of the intersection with New South Street to reduce the curb radius and possibly include a curb extension, reducing the speed of turning vehicles. The City should also consider narrowing the intersection by removing or modifying the channelized right turn island and reducing the corner radius. The team also noted that the signal indications for the right turn movement are unclear, as the signal displays a through green arrow during the Main Street through phase. This provides no clear guidance for drivers turning right.

Members of the team noted that the long cycle length for the traffic signals frequently results in high delays which sometimes causes aggressive driving and red light running. The City should consider revising the signal timing where feasible to reduce cycle lengths, allowing for more frequent crossing opportunities for pedestrians and reduced red light times for drivers.

Members of the team observed that the existing signal equipment does not provide accessible pedestrian signal (APS) control and that the pedestrian signals do not include countdown timers. The City should consider upgrading the signal to provide APS equipment and countdown indications.
Members of the team noted that vehicles turning right to New South Street frequently make the transition across the existing bike lane over a large distance, creating an undefined conflict zone for people on bikes. The City should consider removing the right turn lane if traffic capacity allows or modifying the geometry and markings to provide a protected intersection treatment, which would tie in to the previous recommendation to provide separated bike lanes through the study area.

Members of the team noted that the wide, multi-lane approaches make it difficult for bicyclists to make the left turn to State Street or New South Street, especially for bicyclists who arrive on green and are unable to use the eastbound bike box. The City should consider installing two-stage turn queue boxes at the State Street and New South Street to allow bicyclists to make the left turn during the side street green phase. The city should also restripe the existing bike box and install green pavement markings.

Short Term Recommendations

- Restripe the existing diagonal crosswalk at State Street.
- Install flashing yellow arrow signal phasing at West Street.
- Revise traffic signal timing to reduce cycle lengths.
- Install two-stage turn queue boxes.
- Upgrade the signal to provide APS equipment and pedestrian countdown indications.
- Restripe the existing bike box and add green pavement markings.

Long Term Recommendations

- Reconstruct the two intersections to provide the following measures:
    - Reduced number of lanes where capacity allows;
    - Reduced corner radii, removal or modification of the channelized turn island, and curb extensions where feasible;
    - New crosswalks across Main Street and Elm Street at West Street;
    - Protected intersection geometry with bicycle signal control for through bicyclists; and
    - Improved geometry for left turns.

Intersection: Main Street at Masonic Street

Existing Conditions

Masonic Street is two-way with parking on the west side. Crosswalks are provided across Masonic Street and the east leg of Main Street. Members of the team noted that the number of lanes at the Main Street crosswalk is undefined. West of the crosswalk, two striped through lanes and a right turn lane are provided at State Street, however, no lane striping is provided at Masonic Street. The existing section at Masonic Street provides approximately 45 feet between parking lanes, allowing for four lanes of traffic.

Crash data indicate that there were three pedestrian involved crashes at the intersection with Masonic Street during the period analyzed. Each of the crashes involved a pedestrian within the crosswalk across Main Street and all resulted in injuries.

Observations and Recommendations

Figure 6 - Pedestrians cross Main Street at Masonic Street.

Members of the team noted that parking adjacent to the crosswalk on the eastbound and westbound approaches limits sight distance for pedestrians. The City should consider removing one parking space on each approach to provide sufficient sight distance for pedestrians crossing Main Street. Members of the team also observed that the existing bus stop on Main Street eastbound west of Masonic Street is heavily utilized, and that the narrow sidewalk has limited space for pedestrians to disembark from the bus, especially when the wheelchair loading ramp was deployed from the bus. Construction work is ongoing for the adjacent park, and it is expected that the park will include a bus shelter, wider sidewalk facilities, and bike parking.

Members of the team noted that buses stopping at the bus stop adjacent to Masonic Street conflict with through bicyclists. Given the high volume of buses stopping at this location, consideration should be given to providing a floating bus stop treatment as part of a larger project to provide separated bike lanes along the Main Street corridor.

Short Term Recommendations

- Remove parking adjacent to the crosswalk.
- Install a bus shelter as part of the ongoing park improvement project.

Long Term Recommendations

- As part of the larger recommendation to provide separated bike lanes through downtown, consider providing a floating bus stop.

Intersections: Main Street at Crafts Ave/Crackerbarrell Alley, at Old South Street, and at Center Street

Existing Conditions

The intersections of Main Street at Crafts Ave/Crackerbarrell Alley and at Old South Street are both unsignalized, with STOP control provided on the northbound Old South Street approach. Crackerbarrell Alley is one-way away from the intersection, providing shared vehicle and pedestrian access to the rear parking lot. Crafts Ave is one-way away from the intersection, with angle parking provided on the west side south of the intersection. Old South Street is one-way approaching Main Street, with separate left and right turn lanes at the intersection approach and parallel parking provided on the east side. Crosswalks are provided across the side street approaches and across Main Street at the west corner of Crafts Ave and the east corner of Old South Street. Parallel parking is provided on both sides of Main Street west of Crafts Ave while angle parking is provided on both sides of Main Street east of Crafts Ave.

The intersection of Main Street at Center Street is unsignalized. Center Street is a two-way street with parallel parking provided on the west side. Crosswalks are provided across the Center Street approach and across Main Street on the west corner.

The crash data indicate that there were two pedestrian involved crashes during the period analyzed, both involving a pedestrian crossing Old South Street, one of which resulted in an injury. There was one bicycle involved crash at the intersection with Crafts Ave which also resulted in an injury.

Observations and Recommendations

Members of the team noted that Main Street is extremely wide at the unsignalized crossings which creates several operational and safety issues for crossing pedestrians. The roadway is 92 feet wide at the crosswalk east of Old South Street, resulting in unexpected vehicle conflicts, long crossings, and visibility issues. Pedestrians hear and feel the traffic speeding up behind them while still in the crosswalk which is disconcerting. Drivers experience delays at the crosswalk due to the long crossing distance for pedestrians as well. Some drivers stop when seeing a pedestrian in the crosswalk in the opposite lanes, while others continue through the crosswalk knowing that the pedestrian will not reach them for several seconds. These potential double threat locations cause pedestrians to move even slower across the street. As previously noted, the City should consider narrowing the roadway throughout this segment to provide improved pedestrian and bicycle facilities.

Members of the team noted that the existing parking, sidewalk furniture, and roadway geometry at the Crafts Avenue intersection results in poor sight distance and high vehicle turning speeds which impact both crosswalks. The City should consider removing the two parking spaces and relocating sidewalk furniture in front of City Hall in order to improve sight distance to both crosswalks. In the long term, the City should consider reconstructing the south side of Main Street to provide curb geometry that follows the curvature of the roadway and provides a reduced turning radius to Crafts Ave. This will reduce turning speeds and improve driver and pedestrian expectancy.

Figure 7 - Parked cars block sight distance for pedestrians at Crafts Avenue.

City staff noted that the City has explored the possibility of closing Crackerbarrell Alley to vehicular traffic, converting it to a pedestrian access to the rear parking lot. Given that the existing parking lot is also served by driveways on Masonic Street immediately north of the intersection, this closure would reduce conflicts between vehicles and pedestrians while having minimal impact on vehicular access to the parking lot. Closing Crackerbarrell Alley would allow the crosswalk in front of City Hall to be relocated from its current angled position to a more direct alignment improving visibility and decreasing the crossing distance. City staff also noted that the sidewalk on Main Street adjacent to Crackerbarrell Alley is a pinch point. The City should consider widening the sidewalk along this segment in order to match sidewalks along the rest of the corridor.

Members of the team also noted that the angle parking spaces adjacent to both crosswalks across Main Street limit sight distance for pedestrians. At the crosswalk across Main Street, the handicap accessible parking space on the north side west of the crosswalk requires drivers to back into the crosswalk in order to exit the space. The City should remove four angle parking spaces and relocate the handicap accessible space in order to improve sight distance and prevent drivers from backing into the crosswalk. As a long term measure, the City should consider constructing curb extensions at both crosswalks, which may create an opportunity for a pocket park. In the short term, it may be necessary to

Figure 8 - Parked cars block sight distance to a midblock crosswalk.

provide temporary curb extensions using flex posts to prevent short-term parking from occurring in the clear zones adjacent to the crosswalks. Curb extensions may include bike parking within the area formerly occupied by the angle parking spaces adjacent to the crosswalk, however care should be taken to ensure that proper sight lines are maintained for pedestrians.

Short Term Recommendations

- Remove the two parking spaces and relocate sidewalk furniture in front of City Hall in order to improve sight distance to the crosswalk across Main Street and to the crosswalk across Crafts Ave.
- Remove the angle parking space east of Crackerbarrell Alley to improve sight distance to the crosswalk across Main Street.
- Remove the angle parking spaces on both sides of Main Street within 20 feet of the crosswalk east of Old South Street to improve sight distance to the crosswalk and prevent drivers from backing into the crosswalk.
- Provide temporary curb extensions using paint and flex posts.

Long Term Recommendations

- Reconstruct Main Street to provide curb geometry on the south side of the roadway that matches the curvature of the roadway, reduces corner radii, widens sidewalks adjacent to Crackerbarrell Alley, and provides curb extensions at the two crosswalks across Main Street.
- Install bike parking within the new curb extensions.
- Close Crackerbarrell Alley to vehicular traffic to reduce conflicts with pedestrians on the sidewalk and allow the realignment of the crosswalk in front of City Hall.

Intersection: Main Street at Pleasant Street/King Street

Existing Conditions

The intersection of Main Street at Pleasant Street/King Street is a large signalized intersection with three to four travel lanes provided on each approach, including exclusive left turn lanes on all four approaches. The traffic signal provides protected plus permitted left turn phasing on the northbound, southbound, and eastbound approaches plus an exclusive pedestrian phase. City staff noted that there is an ongoing project under design to modify the traffic signal to provide protected plus permitted left turn phasing on the westbound approach.

Crash data indicate that there was one pedestrian involved crash at the intersection during the period studied which did not result in an injury. There were five bicycle involved crashes reported at the intersection four of which resulted in injury and one of which resulted in a fatality. The fatal crash involved a left turning vehicle which failed to yield to an oncoming bicyclist.

Observations and Recommendations

Figure 9 - Pedestrians cross during the exclusive pedestrian phase.

Members of the team noted that due to the large size of the intersection and the complex signal phasing, pedestrians typically comply with the traffic signals and cross during the exclusive pedestrian phase. Many pedestrians were observed crossing the intersection diagonally during the pedestrian phase. The City should consider installing continuous corner ramps to allow for diagonal crossing and updating the signal timing to provide appropriate clearance for the diagonal crossing. Members of the team suggested that the intersection may be reconstructed as a raised table intersection, allowing for pedestrian crossing in all directions during the pedestrian phase.

Members of the team observed that the existing pedestrian push buttons do not provide accessible pedestrian signal (APS) control and that the pedestrian signals do not include countdown timers. The City should consider upgrading the signals to provide APS equipment and countdown indications. As part of the ongoing project to install a protected plus permitted left turn phase for the westbound approach, the City should also consider installing flashing yellow arrow indications on all four approaches to remind drivers to yield to through vehicles and bicycles during the through phase.

The existing intersection does not provide any bike facilities consistent with the entire existing corridor. The City should consider installing protected intersection treatments as part of a project to provide separated bike lanes along the Main Street corridor as recommended above. Given the large size of the existing intersection, it would likely be feasible to provide separated bike lanes and protected intersection geometry, especially if complementary facilities are also provided in the future on Pleasant Street and/or King Street. The protected intersection treatments would provide improved separation between vehicles, pedestrians, and cyclists and reduce the incidences of crashes between turning vehicles and cyclists.

Short Term Recommendations

- Install full radius corner ramps to allow for diagonal pedestrian crossing.
- Update signal clearance times to allow for diagonal pedestrian crossing.
- Upgrade the signal to provide APS equipment and pedestrian countdown indications.
- Upgrade the signal to provide flashing yellow arrow indications.

Long Term Recommendations

- Reconstruct the intersection to provide a raised table and/or protected intersection to improve access and crossing for both pedestrians and bicyclists.

Appendix A lists all the observations and recommendations that were discussed during the assessment and described in the previous sections. The observations and recommendations are divided by location. For each observation and recommendation, the appendix includes the estimated time frame for completion, estimated construction costs, and the responsible agency. The time frame is categorized as short-term (0 to 3 years) or long-term (>3 years). The costs are categorized as low (<$10,000), medium ($10,001 to $50,000), or high (>$50,000).

Appendix B provides a toolbox of pedestrian facilities that summarizes typical treatments and provides a description. The treatments may or may not be recommendations outlined in this report. This toolkit may be used by the City of Northampton to assist in developing a more pedestrian-friendly town.

Appendix C provides a toolbox of bicycle facilities that summarizes typical treatments and provides a description. The treatments may or may not be recommendations outlined in this report. This toolkit may be used by the City of Northampton to assist in developing a more bicycle-friendly town.

Appendix A: Table of Recommendations

Location	Issue	Recommendation	Time Frame	Cost	Agency
Corridor-wide	Crosswalks are very long and have poor sight distance	Remove parking adjacent to crosswalks	Short-term	Low	City of Northampton
		Reduce the number of travel lanes on Main Street	Short-term	Medium	City of Northampton
		Construct curb extensions and refuge islands at yield controlled crosswalks	Long-term	High	City of Northampton
	No dedicated bicycle facilities are provided on Main Street through downtown	Alternative 1: Install separated bike lanes (cycle tracks) adjacent to the curb	Short-term	Medium	City of Northampton
		Alternative 2: Install bike lanes and convert angle parking to back-in	Short-term	Medium	City of Northampton
		Alternative 3: Install center running two-way separated bike lane (cycle track)	Short-term	Medium	City of Northampton
		Construct street or sidewalk level separated bike lanes (cycle tracks) with curb separation.	Long-term	High	City of Northampton
	Curb ramps do not meet current Access Board guidelines	Reconstruct curb ramps to provide ADA compliant ramps	Short-term	Medium	City of Northampton
	Large trucks use Main Street as a long-distance through route	Implement a truck restriction on Main Street through downtown	Long-term	Low	Northampton/ MassDOT
	Business signs and sidewalk cafés obstruct the clear walking path	Enforce ordinances and educate business owners to keep the walking zones clear.	Short-term	Low	Northampton/ Businesses
	Access routes to the adjacent trail network are unclear	Install wayfinding signage directing bicyclists & pedestrians to trail access points.	Short-term	Low	City of Northampton
	Bike parking is very limited	Install bike parking including single bike racks and high capacity, covered bike parking.	Short-term	Medium	City of Northampton
	Pedestrian signals do not meet current standards and provide inconsistent phasing	Install pedestrian countdown timer indications and APS equipment.	Short-term	Medium	City of Northampton
		Revise signal timing to provide consistent pedestrian phasing at all intersections.	Short-term	Low	City of Northampton

Location	Issue	Recommendation	Time Frame	Cost	Agency
Main Street/Elm Street at West Street and at State Street/New South Street	Existing diagonal crosswalk at State Street is faded	Restripe the existing crosswalk	Short-term	Low	City of Northampton
	Drivers turning left to West Street do not always yield to oncoming traffic and pedestrians	Install flashing yellow arrow signal phasing at West Street	Short-term	Low	City of Northampton
	Long signal cycle length causes driver frustration and red light running.	Modify signal timing to reduce cycle lengths	Short-term	Low	City of Northampton
	Bikes have difficulty turning left to State Street and New South Street	Install two-stage turn queue boxes on the side street approaches	Short-term	Low	City of Northampton
	Existing signal equipment does not provide accessible pedestrian signals and countdown timers	Install accessible pedestrian signals and countdown timers	Short-term	Medium	City of Northampton
	Intersection has a high crash rate	Reconstruct both intersections to reduce lanes, add crosswalks at all legs, reduce corner radii, improve left turn geometry, and provide protected intersection treatment for bicyclists	Long-term	High	City of Northampton
Main Street at Masonic Street	On-street parking limits sight distance for pedestrians at the crosswalk	Remove parking adjacent to the crosswalk	Short-term	Low	City of Northampton
	No shelter is provided at the existing bus stop	Install a bus shelter as part of the ongoing park improvement project	Short-term	Medium	City of Northampton
	Buses conflict with bikes at the bus stop	Install a floating bus stop as part of a project to install separated bike lanes on Main Street	Long-term	High	City of Northampton

Location	Issue	Recommendation	Time Frame	Cost	Agency
Main Street at Crafts Ave/Crackerbarrell Alley, at Old South Street, and at Center Street	On-street parking limits sight distance for pedestrians at the crosswalks	Remove the two parking spaces in front of City Hall	Short-term	Low	City of Northampton
		Remove the angle parking space east of Crackerbarrell Alley	Short-term	Low	City of Northampton
		Remove the angle parking spaces on both sides of Main Street adjacent to the crosswalk east of Old South Street	Short-term	Low	City of Northampton
	Curb alignment does not match the curvature of the roadway	Reconstruct Main Street to provide curb following the curvature of the roadway and widen the sidewalk at Crackerbarrell Alley	Long-term	High	City of Northampton
	Vehicles entering Crackerbarrell Alley cross the sidewalk	Close Crackerbarrell Alley to vehicular traffic	Long-term	Medium	City of Northampton
Main Street at Pleasant Street/ King Street	Pedestrians cross the intersection diagonally	Install full radius corner ramps	Short-term	Medium	City of Northampton
		Update signal clearance times to allow for diagonal crossing	Short-term	Low	City of Northampton
		Reconstruct the intersection to provide a raised table	Long-term	High	City of Northampton
	Existing signal equipment does not provide accessible pedestrian signals and countdown timers	Install accessible pedestrian signals and countdown timers	Short-term	Medium	City of Northampton
	Intersection does not provide bicycle accommodations	Reconstruct the intersection to provide a protected intersection	Long-term	High	City of Northampton

Appendix B: Pedestrian Facility Toolbox

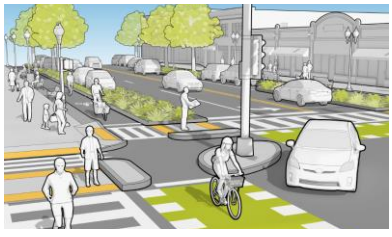
Facility Type	Description	Sample Photo
Accessible Pedestrian Signals	Accessible pedestrian signals systems are the components used at a signalized intersection to alert pedestrians when they may cross a roadway. Accessible pedestrian signals may include audible and vibrating features to assist visually-impaired pedestrians.	
Crosswalk	Crosswalks indicate to pedestrians the appropriate place to cross the street and inform drivers of potential pedestrian movements in the street.	
Curb Ramp and Detectable Warning Panels	ADA-compliant curb ramps provide ramped access and detectable warning for persons with disabilities. Curb ramps are typically at least 5 feet wide with a level landing pad. Detectable warning panels should be a contrasting color to the adjacent surface.	
Curb Extensions	A curb extension is an extension of the sidewalk at intersections or mid-block to reduce the pedestrian crossing distance and provide greater visibility for pedestrians waiting to cross a street.	
Curb Radii	Modifications to curb lines or edges of the pavement at an intersection. These modifications typically are used to decrease crossing distances for pedestrians or to reduce vehicular speed by tightening the turning radii at the intersection corners.	

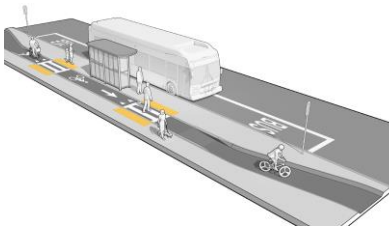
Facility Type	Description	Sample Photo
Edge Lines	Edge lines are solid white lines painted along the roadside curb that defines the driving lane and visually narrows the travel lane. In some cases, edge lanes may be used to create bicycle lanes.	
In-Street Pedestrian Crossing Sign	A removable high-visibility sign placed on the centerline of a street prior to a crosswalk to alert motorists to yield when pedestrians are present in the crosswalk.	
Leading Pedestrian Interval	A pedestrian crossing indication that permits pedestrians to move into the intersection 3-7 seconds before a green light is given to turning motorists that may cross the crosswalk.	
Parklet	Permanent or temporary gathering area installed in the street adjacent to the curb as an extension of sidewalk space.	
Pedestrian Hybrid Beacon	An overhead flashing beacon activated by pedestrians. The flashing lights alert motorists to yield and increase visibility of pedestrians in the crosswalk.	

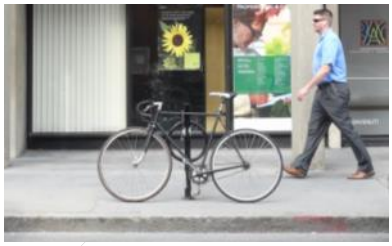
Facility Type	Description	Sample Photo
Pedestrian Refuge Island	Raised median or island that provides in-street refuge at a pedestrian crossing. The crosswalk may be angled at refuge to encourage pedestrians to make eye contact with oncoming traffic.	
Pedestrian-Scale Lighting	Light fixtures used to illuminate a sidewalk or pathway typically closer to the ground and placed closer together than roadway lighting.	
Raised Intersection	A crosswalk or entire intersection raised from street-level to sidewalk-level. This elevated crossing increases pedestrian priority and visibility and slows approaching vehicles.	
Rectangular Rapid Flash Beacon	An on-demand activated flashing beacon with a “wig-wag” pattern that alerts motorists to pedestrians in the crosswalk. Typically used on lower volume and lower speed streets.	
Shared Street	The road surface is typically at the same level as the sidewalk surface to create a continuous pedestrian space. A shared street is for motorists, pedestrians, and bicyclists.	

Facility Type	Description	Sample Photo
Shared-use Path	A two-way path that is open for bicyclists, pedestrians, and other non-motorized users. The path is typically ADA-compliant and ranges between 10 to 14 feet wide.	
Sidewalk	A concrete pathway adjacent to the roadway. Sidewalks must meet minimum dimensions and smoothness for ADA-compliance. They may have decorative paving or plantings and should be wider where high pedestrian volumes are present or desired.	

Appendix C: Bicycle Design Toolbox

Facility Type	Description	Sample Photo
Shared Lane Markings	Designate positioning for cyclists within shared travel lanes and alert drivers to the presence of cyclists. Shared lane markings should be considered temporary measures until future improvements can provide full bicycle facilities.	
Bike Lane	Exclusive travel lane for bicycles, typically located along the right side of the travel lanes on a two-way street, however may be located on either side of a one-way street.	
Buffered Bike Lane	Bicycle lane with a painted buffer separating cyclists from adjacent vehicle traffic and/or adjacent parking lanes.	
Separated Bike Lane	Bicycle lane protected from vehicle traffic by adjacent vertical elements, including flex posts, planters, parked cars, curbs, or raised medians.	
Protected Intersection	Physical separation carried through the intersection to minimize exposure to conflicts, reduce speed at conflict points, communicate right-of-way priority, and provide adequate sight distance between all users.	

Facility Type	Description	Sample Photo
Floating Bus Stop	Floating bus stops adjacent to separated bike lanes allow for separation between transit users and bicyclists. The bus stop geometry provides an island for passengers to disembark outside of the bike lane and then safely cross to the sidewalk.	
Bike Box	Advance stop bar allows bicyclists to stop at a traffic signal ahead of vehicle traffic to increase visibility and allow for left turns.	
Two-Stage Turn Queue Box	Turn box typically provided between the bicycle lane and the cross-street crosswalk allows cyclists to turn out of the bicycle lane and complete a left turn after the traffic signal cycles to the side street green phase.	
Bike Signal	Exclusive traffic signal for bicycle facilities allows for time separation between cyclists and vehicles, especially at locations with high turning volumes.	
High Capacity Bike Parking	Large bicycle racks at key locations. Bicycle racks should always be placed in areas of high visibility in order to maximize use and provide increased security.	

Facility Type	Description	Sample Photo
Bike Corral	Bicycle racks placed within the parking lane of a roadway. A single corral can replace one vehicle parking space with 10 to 12 bicycle parking spaces.	
Individual Bike Parking	Individual bicycle racks typically placed along sidewalks to provide incremental bicycle parking throughout a larger area. Racks should be designed to support the bicycle at two points.	
Wayfinding	Signage provides guidance for cyclists on recommended routes to key destinations.	
Curb Extensions	Curb and associated accessible sidewalk ramp is extended to the edge of the bicycle lane or travel lane in order to reduce through vehicle speeds and increase visibility for pedestrians.	

Appendix D: Crash Data

MassDOT
Massachusetts Department of Transportation
Highway Division

COLLISION DIAGRAM

SYMBOLS	TYPE OF CRASH	SEVERITY
Moving Vehicle	Head on	
Backing Vehicle	Rear End	Injury
Non–Involved Vehicle	Angle	
Pedestrian	Turning Movement	Fatal
Bicycle	Sideswipe	
Animal	Out of Control	
Parked Vehicle	Night Time Crash	
Fixed Object		

Northampton, MA

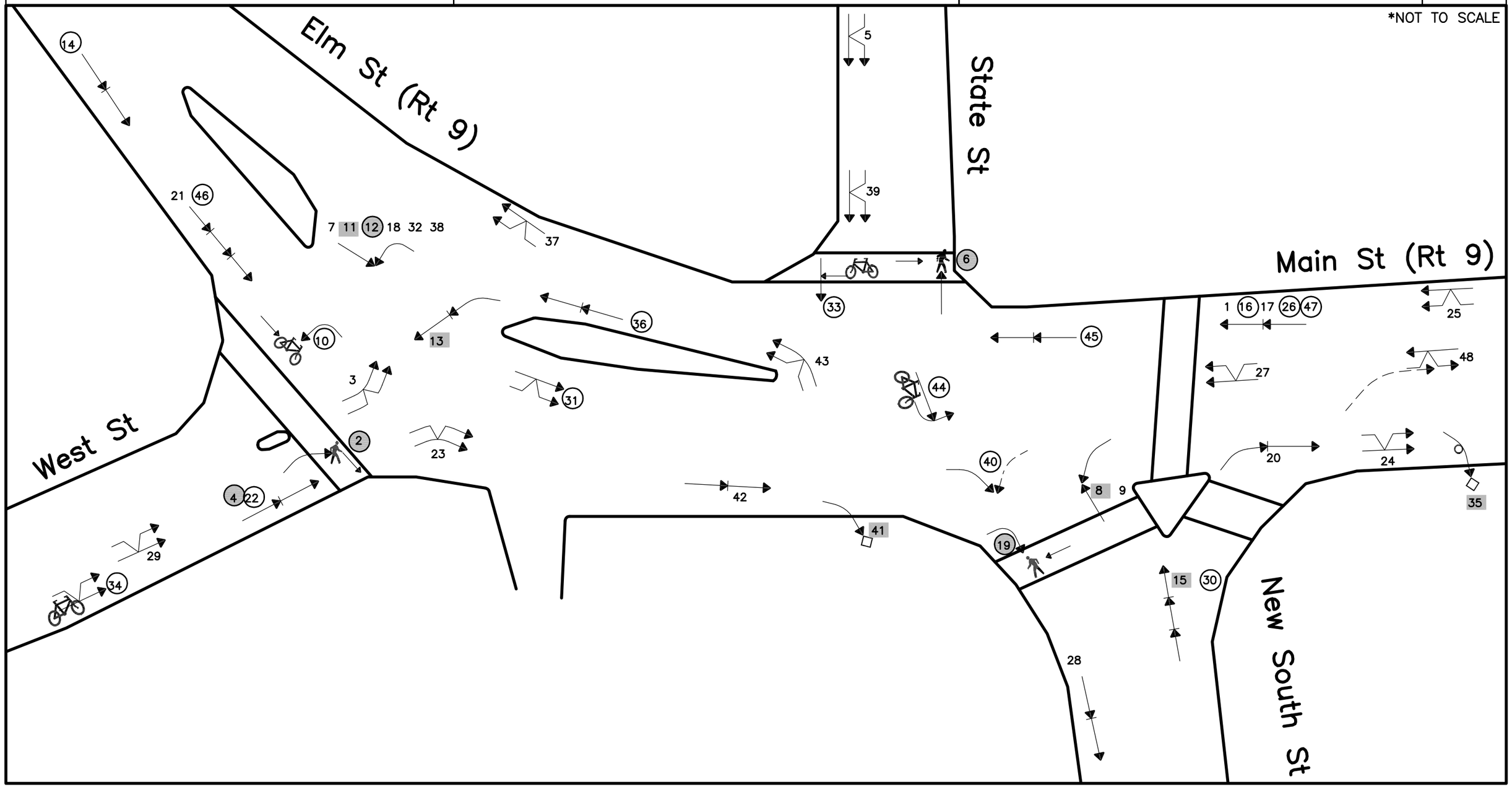
Main St/Elm St (Rt 9) at New South St (Rt 10), State St and West St (Rt 66)

REGION: Pioneer Valley Planning Commission

TIME PERIOD ANALYZED: Jan. 2012 – Aug. 2015
SOURCE OF CRASH REPORTS: Northampton Police Department
DATE PREPARED: 10/15/2015
PREPARED BY: William Ullom

N

*NOT TO SCALE



Crash Data Summary Table

Main St/Elm St (Rt 9) at New South St (Rt 10), State St and West St (Rt 66), Northampton MA

Jan. 2012-Aug. 2015

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages			Comments
	m/d/y			*Type*	*Type*	*Type*	*Type*	*Type*	*D1*	*D2*	*D3*	
1	1/18/12	Wednesday	1:12 PM	Rear-end	Daylight	Clear	Dry	Inattention	33	62		Vehicles in left turn lane. Left arrow turns green. MV2 starts to move, MV1 does not. MV2 rear ends MV1.
2	2/2/12	Thursday	7:28 PM	Single Vehicle Crash	Dark - lighted roadway	Unknown	Dry	Inattention	58	24		MV1 turning right at intersection on red light hit pedestrian.
3	3/27/12	Tuesday	9:05 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way	58	48		Driver in the curbside lane turned left alongside a vehicle in the left turn lane.
4	3/30/12	Friday	7:37 PM	Rear-end	Dark - lighted roadway	Clear	Dry	Operating Vehicle in erratic, reckless, careless, negligent, or aggressive manner	35	32		MV2 stops for red light, MV1 did not and rear ends MV2.
5	4/18/12	Wednesday	1:22 PM	Sideswipe, same direction	Daylight	Clear	Dry	No Improper Driving	25	49		MV1, waiting at red light on state st thru-lane, sees green right arrow and decides to change lanes. Does not see MV2 coming up in right lane and hits MV2. There are no lane markings.
6	4/28/12	Saturday	7:59 PM	Single Vehicle Crash	Dusk	Other	Dry	No Improper Driving	85	65		Pedestrian crossing during do not walk and hit by MV1 who has a green light.
7	5/3/12	Thursday	3:06 PM	Angle	Daylight	Rain	Dry	Inattention	22	69		Both vehicles had green light but MV1 (making left turn) did not yield to MV2 (going thru).
8	5/21/12	Monday	7:32 PM	Sideswipe, opposite direction	Dusk	Rain	Wet	Unknown	70	41		MV2, making left turn, rear spun out and vehicle skidded into MV1, who was stopped at red light.
9	6/23/12	Saturday	4:35 PM	Angle	Daylight	Clear	Wet	Driving too fast for conditions	17	51		MV1, making left turn, spun out and skidded into MV2, stopped at red light.
10	6/28/12	Thursday	4:19 PM	Single Vehicle Crash	Daylight	Clear	Dry	Failed to yield right of way	18			Both vehicles may have had green light but MV1 (making left turn) hit cyclist. Cyclist fled the scene.
11	7/15/12	Sunday	7:30 PM	Angle	Dusk	Rain	Wet	No Improper Driving	44	40		MV1 turning left from elm st to west st, claims had green arrow. MV2, going thru, also claims he had a green light.
12	7/27/12	Friday	9:32 PM	Angle	Dark - lighted roadway	Clear	Dry	Failed to yield right of way	22	21		Both vehicles had green light but MV1 (making left turn) did not yield to MV2 (going thru).
13	9/12/12	Wednesday	5:00 PM	Rear-end	Dusk	Clear	Dry	No Improper Driving	25	37		MV2 waiting to turn left onto west st rear ended by MV1 as the light changed to yellow.
14	10/1/12	Monday	2:41 PM	Rear-end	Daylight	Clear	Dry	Inattention	47	47		MV2 stopped in traffic rear ended by MV1 who did not stop in time.
15	11/27/12	Tuesday	5:51 PM	Rear to Rear	Dark - lighted roadway	Rain	Wet	Followed too closely	21	36	22	MV1 and MV2 at green light yielding to an emergency vehicle, MV3 does not realize this and rear ends vehicles. Miscoded as rear-to-rear.
16	12/3/12	Monday	12:24 PM	Rear-end	Daylight	Clear	Dry	Followed too closely	18	59		MV1 unable to stop in time before rear ending MV2, glare may have contributed.
17	12/15/12	Saturday	4:37 PM	Rear-end	Daylight	Clear	Dry	Inattention	39	55		MV1 and MV2 at red light. Light turns green and MV1 accelerates, but MV2 does not. MV1 rear ends MV2.
18	12/28/12	Friday	12:04 PM	Angle	Daylight	Cloudy	Wet	Inattention	22	43		MV1 was turning left from elm st to west st and had green. Did not realize they had to yield to traffic in the opposite direction.
19	10/5/13	Saturday	7:03 PM	Angle	Dark - lighted roadway	Rain	Wet	No Improper Driving	27	20		Right turning vehicle hit pedestrian who stepped into crosswalk.
20	10/14/13	Monday	4:40 PM	Rear-end	Daylight	Clear	Dry	No Improper Driving	43	55		MV1 did not see that MV2 had stopped in traffic.
21	10/17/13	Thursday	3:52 PM	Rear-end	Daylight	Clear	Dry	Inattention	39	45	38	MV 3 and MV 2 stopped at red light, MV1 did not stop in time.
22	11/2/13	Saturday	1:58 PM	Rear-end	Daylight	Clear	Dry	Other improper action	47	64		Both vehicles stopped at red light, rear one lets up on brake and rolls into front one.
23	12/30/13	Monday	12:32 PM	Angle	Daylight	Clear	Dry	Other improper action	53	52		MV1 waiting at green light on west st for blocked intersection to clear. MV2 attempts to go around MV1 on the left and clips MV1.
24	4/2/14	Wednesday	8:03 AM	Sideswipe, same direction	Daylight	Cloudy	Dry	Inattention	38	50		MV2 attempted to pass bus that was pulling off to the side of the road and clipped the rear left corner of bus.
25	5/1/14	Thursday	6:05 PM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention	32			Bus attempting to pull into bus stop hit a parked vehicle.
26	5/4/14	Sunday	4:27 PM	Rear-end	Daylight	Clear	Dry	Inattention	26	63		MV2 stopped for yellow light, MV1 thought MV2 would go through.
27	5/14/14	Wednesday	5:12 PM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention	36	22		MV2 was in left turn lane with green light, MV1 attempted to enter left turn lane from stopped middle lane and hits MV2.
28	6/3/14	Tuesday	10:28 AM	Rear-end	Daylight	Clear	Dry	Emotional	44	29		MV2 stopped with traffic and was rear ended by MV1
29	6/10/14	Tuesday	9:58 AM	Angle	Daylight	Clear	Dry	Inattention	35	22		MV1 attempted to merge into right lane and did not see MV2 in right lane next MV1.
30	7/22/14	Tuesday	6:00 PM	Rear-end	Daylight	Clear	Dry	Distracted	48	60	50	MV1. MV2, MV3 stopped at red light, light turned green and MV3 began to move without checking ahead, distracted by jewelry.
31	8/22/14	Friday	3:09 PM	Sideswipe, same direction	Daylight	Cloudy	Dry	Over-correcting/over-steering	64	41		MV1, a bus, took the curve around elm st too tightly and hit MV2 in adjacent lane waiting to turn left onto state st.
32	9/1/14	Monday	1:24 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way	56	35		MV1, turning left from elm to west st. One lane of opposing traffic stopped but not both, resulting in a courtesy crash.
33	10/14/14	Tuesday	7:13 AM	Single Vehicle Crash	Daylight	Rain	Wet	Inattention	60	18		Bicyclist listening to i-pod riding on sidewalk did not stop at red light and hit vehicle traveling perpendicularly.
34	11/22/14	Saturday	12:46 PM	Sideswipe, same direction	Daylight	Snow	Dry	Unknown		33		The rear quarter panel of passing vehicle grazed bicyclist causing him to crash.

Crash Data Summary Table

Main St/Elm St (Rt 9) at New South St (Rt 10), State St and West St (Rt 66), Northampton MA

Jan. 2012-Aug. 2015

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages			Comments
	m/d/y			*Type*	*Type*	*Type*	*Type*	*Type*	*D1*	*D2*	*D3*	
35	12/9/14	Tuesday	2:05 AM	Single Vehicle Crash	Dark - lighted roadway	Sleet, Hail, Freezing Rain	Ice	No Improper Driving	37			Driver lost control of vehicle on ice while attempting to slow down approaching intersection and hit a lamp post.
36	1/13/15	Tuesday	9:47 AM	Rear-end	Daylight	Clear	Dry	Inattention	35	69		MV2 stopped for red light. MV1 did not notice light change and rear ended MV2.
37	1/30/15	Friday	3:16 PM	Angle	Daylight	Clear	Dry	No Improper Driving	32	56		Bus suffered mechanical problems and could not negotiate Elm St curve and collided with MV2.
38	2/6/15	Friday	8:13 AM	Angle	Daylight	Clear	Wet	Glare	40	51		Both vehicles had green light but MV1 (making left turn) did not yield to MV2 (going thru).
39	3/23/15	Monday	2:52 PM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention	23	50		MV1 changed lanes into MV2.
40	3/26/15	Thursday	1:39 PM	Single Vehicle Crash	Daylight	Rain	Wet	No Improper Driving	36			Motorcycle was turning right and cut off by opposing left turner causing motorcyclist to "dump." The motorcycle misjudged the New South St right hand turn.
41	4/8/15	Wednesday	8:18 PM	Single Vehicle Crash	Dark - lighted roadway	Rain	Wet	Operating Vehicle in erratic, reckless, careless, negligent, or aggressive manner	39			Intoxicated driver failed to navigate elm st curve and crashed into mast arm.
42	5/27/15	Wednesday	11:58 AM	Rear-end	Daylight	Clear	Dry	Followed too closely	32	35		MV1 and MV2 in right lane waiting to turn. Light for thru movement turns green but not light for right turn. MV1 thinks he has a green light and starts to move forward into MV2 who was still stopped.
43	6/4/15	Thursday	12:01 PM	Sideswipe, same direction	Daylight	Cloudy	Dry	Failed to yield right of way	22	63		MV2 was turning left onto Main St from New South St but had to stop in the intersection because of queued traffic. MV1, behind MV2, attempted to pass around MV2 and was struck by MV2.
44	6/26/15	Friday	12:48 PM	Sideswipe, same direction	Daylight	Clear	Dry	No Improper Driving	48	53		Bicycle alongside vehicle traveling through intersection. Vehicle did not see bicyclist. Given the offset nature of intersection, the bicycle may have assumed the vehicle was turning left too
45	6/29/15	Monday	9:00 AM	Rear-end	Daylight	Cloudy	Wet	Unknown	32	24		MV2 stopped at red light, MV1, travelling behind, did not.
46	6/29/15	Monday	3:46 PM	Rear-end	Daylight	Clear	Dry	Distracted	39	66	16	All vehicles stopped at red light, MV2, at rear, distracted and let foot off brake rolling into two vehicles ahead.
47	8/20/15	Thursday	1:33 PM	Rear-end	Daylight	Clear	Dry	Followed too closely	64	64		MV1 and MV2 in thru lane at red light. Left turn light turns green, but not thru light. MV1, thought they had a green light and rolled into MV2.
48	8/25/15	Tuesday	4:50 PM	Sideswipe, opposite direction	Daylight	Rain	Wet	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc.	53	39		An unknown vehicle pulled into MV1's lane to avoid a stopping bus. MV1 slammed on their brakes and veered into MV2, in the opposing lane.

Summary based on Crash Reports obtained from the Northampton Police Department

Northampton, MA

Main St (Rt 9) at Masonic St

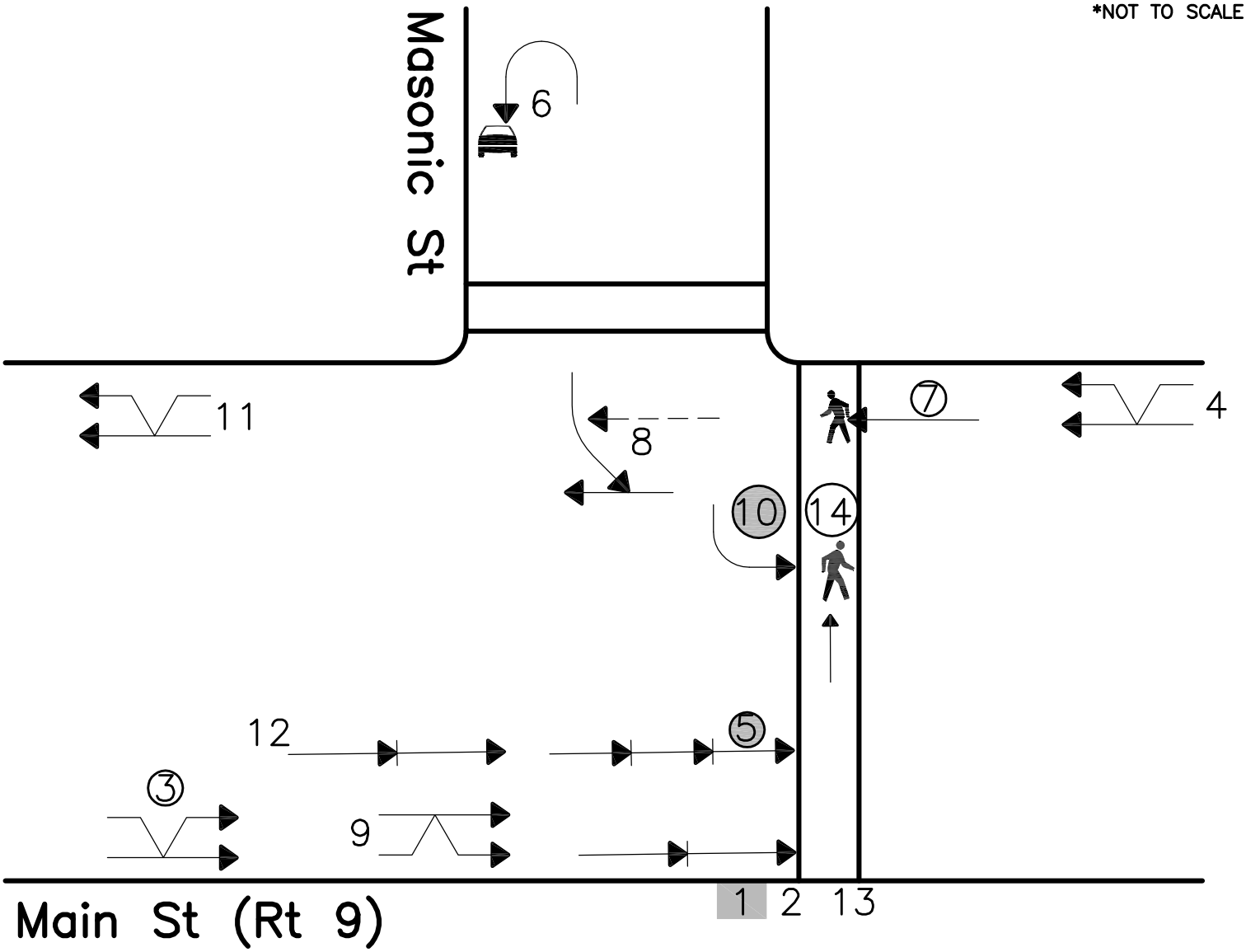
REGION: Pioneer Valley Planning Commission

massDOT Massachusetts Department of Transportation Highway Division

COLLISION DIAGRAM

TIME PERIOD ANALYZED: Jan. 2012 – Aug. 2015
SOURCE OF CRASH REPORTS: Northampton Police Department
DATE PREPARED: 10/9/2015
PREPARED BY: William Ullom

*NOT TO SCALE



SYMBOLS	TYPES OF CRASH	SEVERITY
Moving Vehicle	Head on	
Backing Vehicle	Rear End	
Non–Involved Vehicle	Angle	Injury
Pedestrian	Turning Movement	
Bicycle	Sideswipe	Fatal
Animal	Out of Control	
Parked Vehicle	Night Time Crash	
Fixed Object		

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Crash Data Summary Table

Main St at Masonic St, Northampton, MA

Jan. 2012 - Aug. 2015

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages			Comments
	m/d/y			*Type*	*Type*	*Type*	*Type*	*Type*	*D1*	*D2*	*D3*	
1	3/7/12	Wednesday	7:15 PM	Rear-end	Dusk	Clear	Dry	Inattention	47	56		MV2 stopped for pedestrian. MV1 tried to stop but said she slipped on wet pavement and rearended MV2.
2	4/10/12	Tuesday	1:07 PM	Rear-end	Daylight	Clear	Dry	Followed too closely	22	22		MV1 stopped for pedestian at crosswalk, MV2 was too close and rearended MV1.
3	10/25/12	Thursday	12:19 PM	Sideswipe, same direction	Daylight	Cloudy	Dry	Failure to keep in proper lane or running off road	26	79		PVTA bus, parked on side of street, was attempting to reenter traffic. MV1, alongside bus, attempts to pull in front of bus to park on side of street. MV1 hits the front of the bus.
4	1/24/13	Thursday	11:51 AM	Angle	Daylight	Clear	Dry	Inattention	51	30		While attempting to pull out of a parallel parking spot, MV2 hit MV1, travelling in adjacent lane.
5	2/23/13	Saturday	6:44 PM	Rear-end	Dark - lighted roadway	Rain	Wet	Inattention	41	37	43	MV2, stopped for a pedestrian, was hit by MV1, who was then hit by MV3.
6	3/14/13	Thursday	12:15 PM	Angle	Daylight	Clear	Dry	Inattention	21			MV1 turned onto Masonic St, thought she was driving the wrong way down the street and made a U-turn. During U-turn MV1 hit parked MV2.
7	10/8/13	Tuesday	1:04 PM	Single Vehicle Crash	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	72	47		Driver was paying attention to a dump truck to the left of his vehicle and did not see the pedestrian in the crosswalk before hitting him.
8	10/15/13	Tuesday	2:29 PM	Angle	Daylight	Cloudy	Dry	Inattention	24	46		A vehicle in the right lane of Main St stopped to let MV1 turn left. MV1 did not wait for left lane to stop and hit MV2.
9	10/21/13	Monday	12:14 PM	Angle	Daylight	Clear	Dry	Inattention	50	85		A bus pulled out from picking up passengers and was hit by a car pulling out from a parking space in front of it.
10	3/29/14	Saturday	6:37 PM	Angle	Dark - lighted roadway	Rain	Wet	Unknown	46	32		A driver making a left turn did not see a pedestrian in the crosswalk and hit her.
11	7/27/14	Sunday	1:34 PM	Sideswipe, same direction	Daylight	Rain	Wet	Failed to yield right of way	84	57		MV1was pulling out of a parking spot and hit MV2 who was traveling in the adjacent lane.
12	10/21/14	Tuesday	1:49 PM	Rear-end	Daylight	Cloudy	Dry	Followed too closely	23	20		A bus slowed down to pull into a bus stop occupied by a downstream bus. A car then rear ended the bus.
13	2/1/15	Sunday	12:28 PM	Rear-end	Daylight	Clear	Dry	Inattention	60	42		V1 stopped to allow a pedestrian to cross at a crosswalk and was rear ended by V2.
14	7/9/15	Thursday	9:29 AM	Single Vehicle Crash	Daylight	Cloudy	Dry	Failed to yield right of way	59	52		Vehicle turned left and hit a pedestrian with his mirror.

Summary based on Crash Reports obtained from the Northampton Police Department

MassDOT
Massachusetts Department of Transportation
Highway Division

COLLISION DIAGRAM

SYMBOLS	TYPE OF CRASH	SEVERITY
Moving Vehicle	Head on	
Backing Vehicle	Rear End	Injury
Non–Involved Vehicle	Angle	
Pedestrian	Turning Movement	Fatal
Bicycle	Sideswipe	
Animal	Out of Control	
Parked Vehicle	Night Time Crash	
Fixed Object		

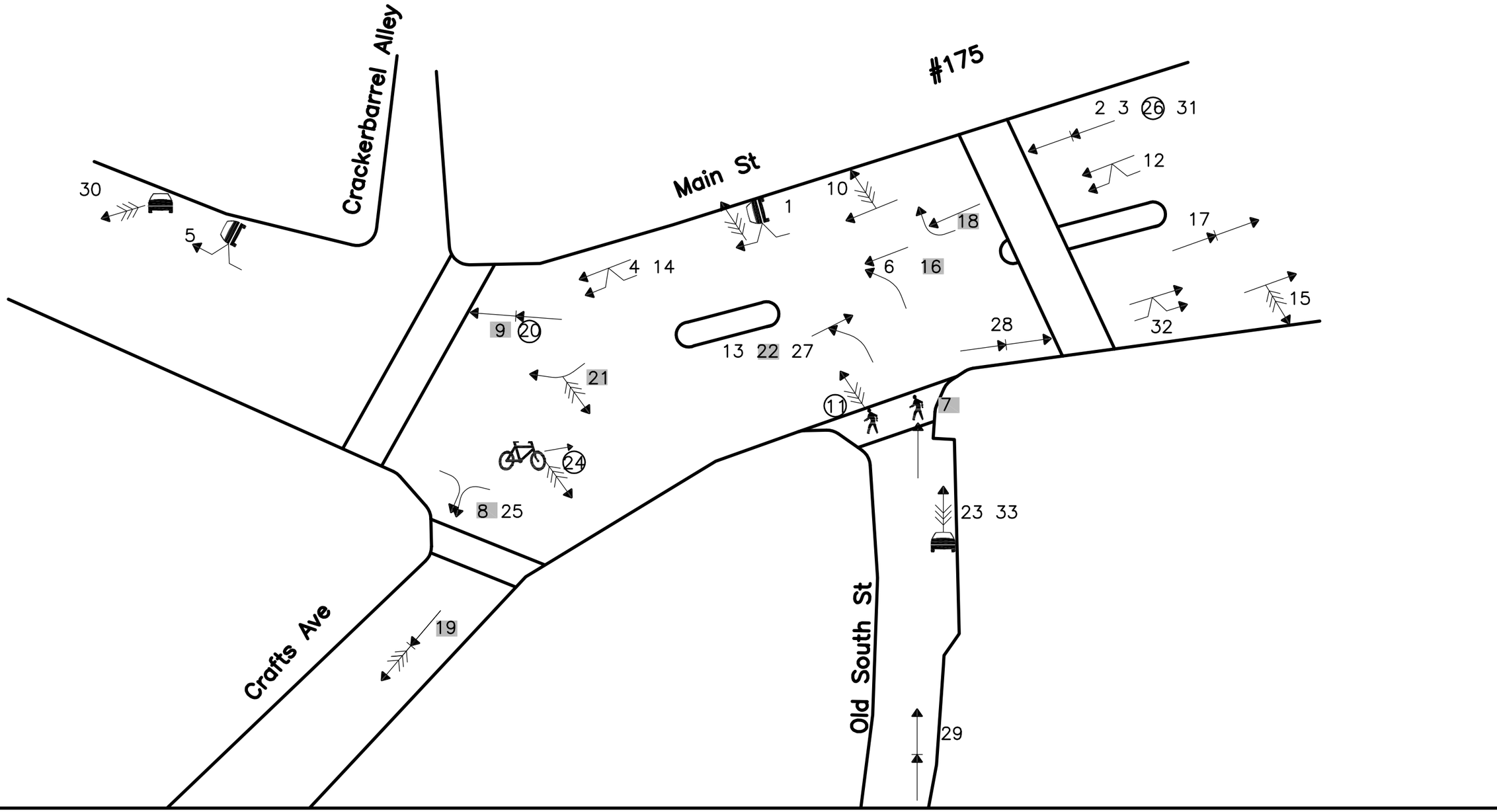
Northampton, MA

Main St at Crafts Ave and Old South St

REGION: Pioneer Valley Planning Commission

TIME PERIOD ANALYZED: Jan. 2012 – Aug. 2015
SOURCE OF CRASH REPORTS: Northampton Police Department
DATE PREPARED: 10/21/2015
PREPARED BY: William Ullom

*NOT TO SCALE



Crash Data Summary Table

Main St at Old South St and Crafts Ave, Northampton, MA

Jan. 2012 - Aug. 2015

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages			Comments
	m/d/y			*Type*	*Type*	*Type*	*Type*	*Type*	*D1*	*D2*	*D3*	
1	1/12/12	Thursday	11:54 AM	Angle	Dark - lighted roadway	Sleet, Hail, Freezing Rain	Snow	Inattention	75	18	69	MV1 lost control on snowy road and hit MV2, parked. MV3, parked next to MV2 then reversed into MV1.
2	2/2/12	Thursday	9:20 AM	Rear-end	Daylight	Cloudy	Dry	Inattention	46	21		MV1 stopped for pedestrian at crosswalk, MV2 did not stop and rear ended MV1.
3	3/17/12	Saturday	10:34 AM	Rear-end	Daylight	Cloudy	Dry	Inattention	25	65		MV2 stopped for a pedestrian at crosswalk. MV1, following, looked down for a moment and did not see MV2 had stopped. Report unclear if vehicles were in EB or WB direction.
4	6/4/12	Monday	3:41 PM	Sideswipe, same direction	Daylight	Rain	Wet	Inattention	19	59		MV1 saw an open parking spot and moved to turn into it, but did not see MV2, to their right and crashed in to MV2.
5	9/25/12	Tuesday	3:45 PM	Sideswipe, same direction	Daylight	Clear	Dry	Operating Vehicle in erratic, reckless, careless, negligent, or aggressive manner	38			MV1 attempted to parallel park and MV1's trailer hit parked MV2.
6	10/29/12	Monday	3:48 PM	Angle	Daylight	Rain	Wet	Inattention	54	55		MV1 was turning left and did not check to the right for oncoming traffic and hit by MV2.
7	11/21/12	Wednesday	6:29 PM	Single Vehicle Crash	Dark - lighted roadway	Clear	Dry	Inattention	71	29	30	Vehicle was approaching the intersection and hit two pedestrians in the sidewalk.
8	11/27/12	Tuesday	7:08 PM	Sideswipe, same direction	Dark - lighted roadway	Rain	Wet	Inattention	39	58		MV1 was turning right and stopped for pedestrians in the crosswalk. MV2 turned left and hit MV1.
9	12/18/12	Tuesday	6:52 PM	Rear-end	Dusk	Rain	Wet	Inattention	75	19		MV2 stopped for pedestrians at a crosswalk, but MV1, following, did not and rear ended MV2.
10	2/2/13	Saturday	3:08 PM	Angle	Daylight	Clear	Dry	No Improper Driving	94	62		While reversing out of an angled parking spot, MV2 backed into MV1, traveling in adjacent lane.
11	2/14/13	Thursday	2:55 PM	Rear-end	Daylight	Clear	Dry	Other improper action	32	29		Vehicle stopped at stop sign, pulled up to turn left and stopped again waiting for traffic to clear. Vehicle then rolled back down steep incline into pedestrian in the crosswalk.
12	2/18/13	Monday	1:11 PM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention	39	41		MV2 was stopped and waiting to turn into angled parking space. MV1 attempted to pass MV2 and had to pass between a snowbank and MV2. MV1 hit MV2 during this maneuver.
13	4/3/13	Wednesday	4:17 PM	Angle	Daylight	Cloudy	Dry	Inattention	77	32		MV1 attempted to turn left, looked left but due to glare did not see MV2 approaching.
14	6/21/13	Friday	1:08 PM	Angle	Daylight	Clear	Dry	Visibility Obstructed	76	56		Both vehicles traveling west on Main St. when MV2 sideswiped MV1.
15	8/26/13	Monday	3:43 PM	Angle	Daylight	Clear	Dry	Inattention	19	36		While reversing out of an angled parking spot, MV1 backed into MV2, traveling in adjacent lane.
16	9/12/13	Thursday	9:29 PM	Sideswipe, same direction	Dusk	Rain	Wet	Failed to yield right of way	22	60		MV1 failed to yield to MV2 while making left turn from a stop.
17	9/13/13	Friday	7:49 AM	Rear-end	Daylight	Rain	Wet	Followed too closely	51	23		
18	10/18/13	Friday	10:10 PM	Angle	Dark - lighted roadway	Clear	Dry	Inattention	28	60		MV1 attempted to turn into an angled parking spot from the left lane. MV2 had stopped for a pedestrian in the crosswalk and MV1 thought MV2 was waiting for him. MV1 began to move into spot and was hit by MV2.
19	11/16/13	Saturday	7:28 PM	Rear-end	Dusk	Clear	Dry	Wrong side or wrong way	27	65		MV1 was reversing in order to enter a parking spot and hit MV2, who was following.
20	11/17/13	Sunday	2:35 PM	Rear-end	Daylight	Rain	Wet	Inattention	27	45		MV1 stopped for a pedestrian in a crosswalk. MV2 was not paying attention and failed to stop.
21	1/30/14	Thursday	6:46 PM	Angle	Dark - lighted roadway	Cloudy	Dry	Inattention	46	61		MV1 was backing out of angled parking along Main St when MV2 made sharp left turn toward Crafts Ave.
22	4/11/14	Friday	11:02 PM	Angle	Dark - lighted roadway	Rain	Wet	Visibility Obstructed	65	63		MV1 was making a left turn and did not see MV2 coming down Main St.
23	7/1/14	Tuesday	4:31 PM	Rear-end	Daylight	Clear	Dry	Other improper action	43			MV1 and MV2 were parked on a steep incline. MV1 began to exit parking spot and rolled back into MV2.
24	7/3/14	Thursday	11:59 AM	Rear-end	Daylight	Clear	Dry	Inattention	30	58		Vehicle pulling out of angled parking was hit by a bicyclist not paying attention.
25	7/7/14	Monday	1:32 PM	Angle	Dusk	Clear	Wet	No Improper Driving	36	50		MV1, turning right, stopped to let a pedestrian cross. Meanwhile MV2 had turned left and passed through the crosswalk prior to MV1 starting up again. MV1 then hit the rear right of MV2.
26	7/15/14	Tuesday	2:47 PM	Rear-end	Daylight	Clear	Dry	Inattention	63	29		MV2 stopped for a pedestrian at crosswalk. MV1, following, attempted to pull into left lane but did not have time and rear ended MV2.
27	8/6/14	Wednesday	12:24 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way	66	52		Courtesy crash. Unknown vehicle in right lane stopped to allow MV1 to cross. MV2 in left lane did not stop.
28	9/10/14	Wednesday	2:36 PM	Rear-end	Daylight	Clear	Dry	Inattention	24	24		MV1 had stopped for a pedestrian in a crosswalk. MV2, turning right did not see this and rear ends MV1 after right turn.
29	12/13/14	Saturday	9:56 AM	Rear-end	Daylight	Clear	Dry	Followed too closely	25	21		MV1 stops quickly and is rear ended by MV2.
30	12/22/14	Monday	3:22 PM	Sideswipe, same direction	Daylight	Clear	Dry	Unknown		64		While parking by backing into a parallel parking spot, MV2 hit MV1, parked ahead of MV2.

Crash Data Summary Table

Main St at Old South St and Crafts Ave, Northampton, MA

Jan. 2012 - Aug. 2015

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages			Comments
	m/d/y			*Type*	*Type*	*Type*	*Type*	*Type*	*D1*	*D2*	*D3*	
31	1/7/15	Wednesday	11:45 AM	Rear-end	Daylight	Clear	Wet	No Improper Driving	70	25		MV1 stopped for a pedestrian at a crosswalk. MV2 attempted to stop but slid on pavement into MV1.
32	4/8/15	Wednesday	4:10 PM	Angle	Daylight	Cloudy	Wet	Inattention	76	51		MV1 turned right from Old South St and then wanted to turn left onto Center St but hit MV2 while attempting to change to the left lane.
33	4/14/15	Tuesday	12:49 PM	Rear-end	Daylight	Cloudy	Dry	Unknown	67			MV1 and MV2 were parked. MV1, attempting to exit parking spot, backed into MV2.

Summary based on Crash Reports obtained from the Northampton Police Department

MassDOT
Massachusetts Department of Transportation
Highway Division

COLLISION DIAGRAM

SYMBOLS	TYPE OF CRASH	SEVERITY
Moving Vehicle	Head on	
Backing Vehicle	Rear End	Injury
Non–Involved Vehicle	Angle	
Pedestrian	Turning Movement	Fatal
Bicycle	Sideswipe	
Animal	Out of Control	
Parked Vehicle	Night Time Crash	
Fixed Object		

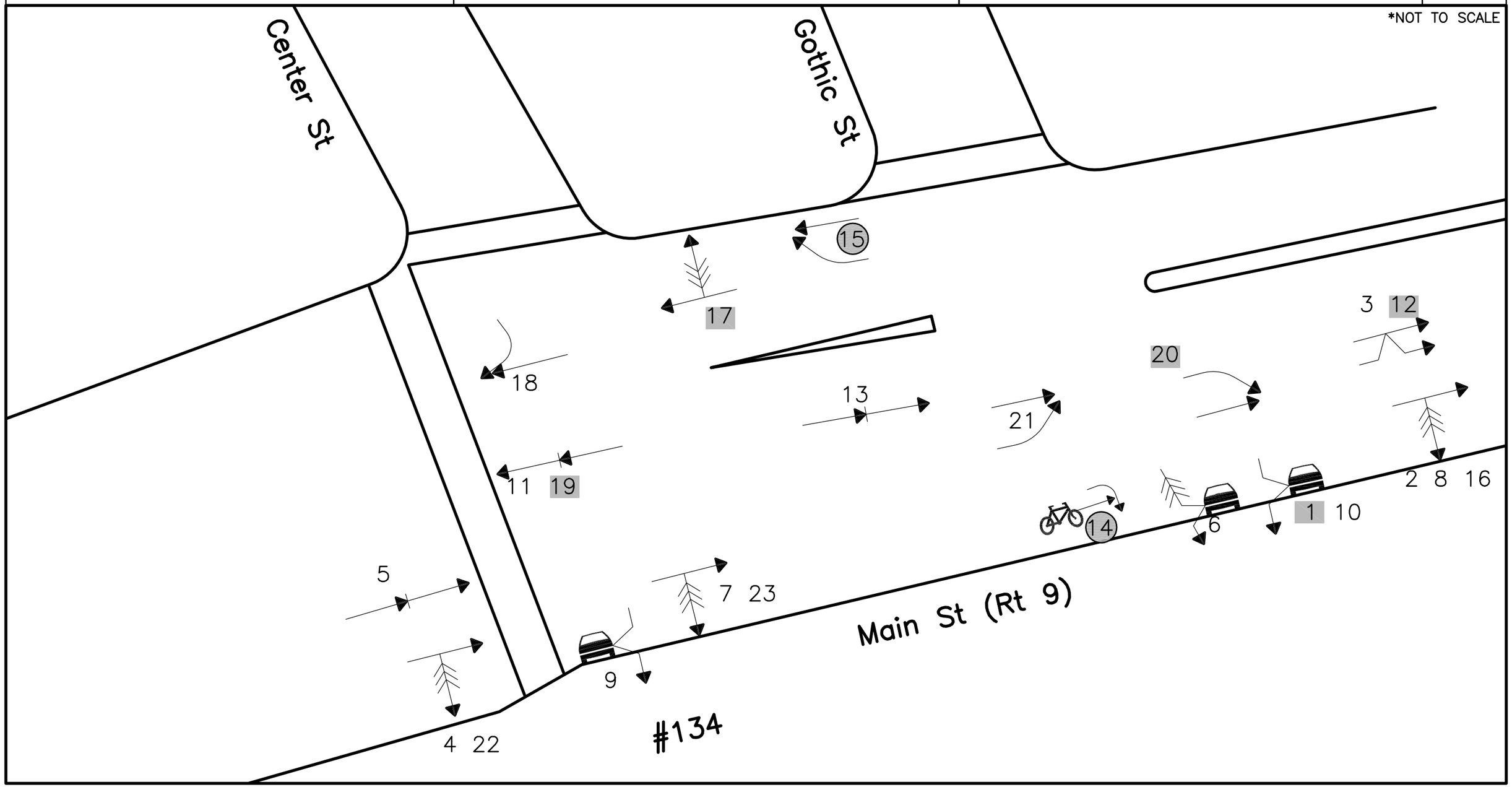
Northampton, MA

Main St at Center St and Gothic St

REGION: Pioneer Valley Planning Commission

TIME PERIOD ANALYZED: Jan. 2012 – Aug. 2015
SOURCE OF CRASH REPORTS: Northampton Police Department
DATE PREPARED: 10/14/2015
PREPARED BY: William Ullom

*NOT TO SCALE



Crash Data Summary Table

Main St at Center St and Gothic St, Northampton, MA

Jan. 2012 - Aug. 2015

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages		Comments
	m/d/y			*Type*	*Type*	*Type*	*Type*	*Type*	*D1*	*D2*	
1	1/8/12	Sunday	6:23 PM	Sideswipe, same direction	Dusk	Clear	Dry	Emotional	UNK	50	MV1 hit adjacent parked vehicle while parking.
2	7/12/12	Thursday	3:03 PM	Sideswipe, opposite direction	Daylight	Clear	Dry	Other improper action	49	16	MV2 was backing out of a parking spot and hit MV1, waiting in traffic.
3	8/13/12	Monday	10:33 AM	Sideswipe, same direction	Daylight	Clear	Dry	Failed to yield right of way	51	46	MV1 was pulling out from parking into queued traffic. MV1 positioned themselves next to MV2 but in the parking stalls and when traffic began to move MV2 hit MV1.
4	10/24/13	Thursday	1:57 PM	Angle	Daylight	Cloudy	Dry	Visibility Obstructed	61	61	MV1 was parked in an angle space, could not see MV2 behind MV1, and reversed into MV2
5	11/23/12	Friday	3:10 PM	Rear-end	Daylight	Clear	Dry	Inattention	70	23	MV1 slowed down for a pedestrian and was rearended by MV2, following too closely, who failed to stop.
6	1/14/13	Monday	4:07 PM	Angle	Daylight	Clear	Dry	Inattention	34	17	MV1 and MV2 were parked next to each other in angle parking spots. MV1 attempted to reverse out of spot and hit MV2.
7	3/5/13	Tuesday	1:50 PM	Angle	Daylight	Clear	Dry	Inattention	60	37	While backing from an angle parking spot, MV2 hit MV1, stopped in traffic in the adjacent lane.
8	4/24/13	Wednesday	6:22 AM	Angle	Daylight	Clear	Dry	Visibility Obstructed	40	43	While reversing out of an angled parking spot, MV1 backed into MV2, traveling in adjacent lane.
9	9/17/13	Tuesday	4:21 PM	Angle	Daylight	Clear	Dry	Over-correcting/over-steering	65		While attempting to park in an angled parking spot MV1 hit MV2, parked in adjacent spot.
10	10/25/13	Friday	1:20 PM	Angle	Daylight	Clear	Dry	Other improper action	59	53	While attempting to park in an angled parking spot MV2 hit MV1's (parked in adjacent spot) open door.
11	11/18/13	Monday	2:37 PM	Rear-end	Daylight	Clear	Dry	Inattention	UNK	62	MV1 stopped for a pedestrian in a crosswalk. MV2 was not paying attention and tried to pass MV1 and hit MV2.
12	12/6/13	Friday	11:58 PM	Sideswipe, same direction	Dark - lighted roadway	Snow	Wet	Failed to yield right of way	32	31	MV2 was attempting to turn right into an angled parking spot. MV1 attempted to pass on the right and hit MV2.
13	4/5/14	Saturday	12:57 PM	Rear-end	Daylight	Clear	Dry	Distracted	51	62	MV2 was stopped in traffic. MV1 was not paying attention to road and rearended MV1.
14	4/12/14	Saturday	7:21 PM	Angle	Dusk	Clear	Dry	Failed to yield right of way	63	20	Vehicle turned into an angled parking spot in front of the approaching bicyclist. Bicyclist hit vehicle.
15	8/14/14	Thursday	10:56 PM	Sideswipe, same direction	Dark - lighted roadway	Clear	Dry	Inattention	21	44	MV2 was turning into a parking spot and made a sharp right turn while approaching the spot and then turned right into the spot. MV1, traveling on the right of MV2 could not stop in time and was hit by MV2.
16	11/1/14	Saturday	3:12 PM	Angle	Daylight	Cloudy	Wet	Visibility Obstructed	57	73	While reversing out of an angled parking spot, MV1 backed into MV2, traveling in adjacent lane.
17	11/16/14	Sunday	6:21 PM	Angle	Dark - lighted roadway	Clear	Dry	Inattention	21	52	MV1 was parked in an angled parking spot and did not see MV2 coming down Main St while reversing.
18	11/20/14	Thursday	3:36 PM	Angle	Daylight	Clear	Dry	Inattention	67	32	MV1 failed to yield to oncoming MV2 while turning right.
19	1/6/15	Tuesday	5:55 PM	Rear-end	Dark - lighted roadway	Snow	Snow	Unknown	UNK	58	MV2 made a quick right turn from Center St in front of MV1 and then suddenly stopped for a pedestrian and was rearended by MV1.
20	2/22/15	Sunday	4:40 AM	Sideswipe, same direction	Dark - lighted roadway	Snow	Snow	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc.	27	25	MV2, travelling in front of and to the left of MV1, attempted to pull into angle parking to the right. MV1 stepped on brakes, slid on snow, hit MV2, then slid into the Pay to Park sign.
21	4/23/15	Thursday	10:07 AM	Angle	Daylight	Clear	Dry	Inattention	48	39	MV1 had just reversed from angle parking and was attempting to make left turn onto Gothic St. MV2 was to MV1's left and when MV1 attempted turn, was hit by MV2.
22	6/1/15	Monday	5:26 PM	Angle	Daylight	Rain	Wet	Inattention	57	50	While reversing out of an angled parking spot, MV2 backed into MV1, stopped in traffic in adjacent lane.
23	7/31/15	Friday	2:44 PM	Angle	Daylight	Cloudy	Dry	Inattention	39	27	While reversing out of an angled parking spot, MV1 backed into MV2, traveling in adjacent lane.

Summary based on Crash Reports obtained from the Northampton Police Department

Northampton, MA

Main St at Pleasant St/King St

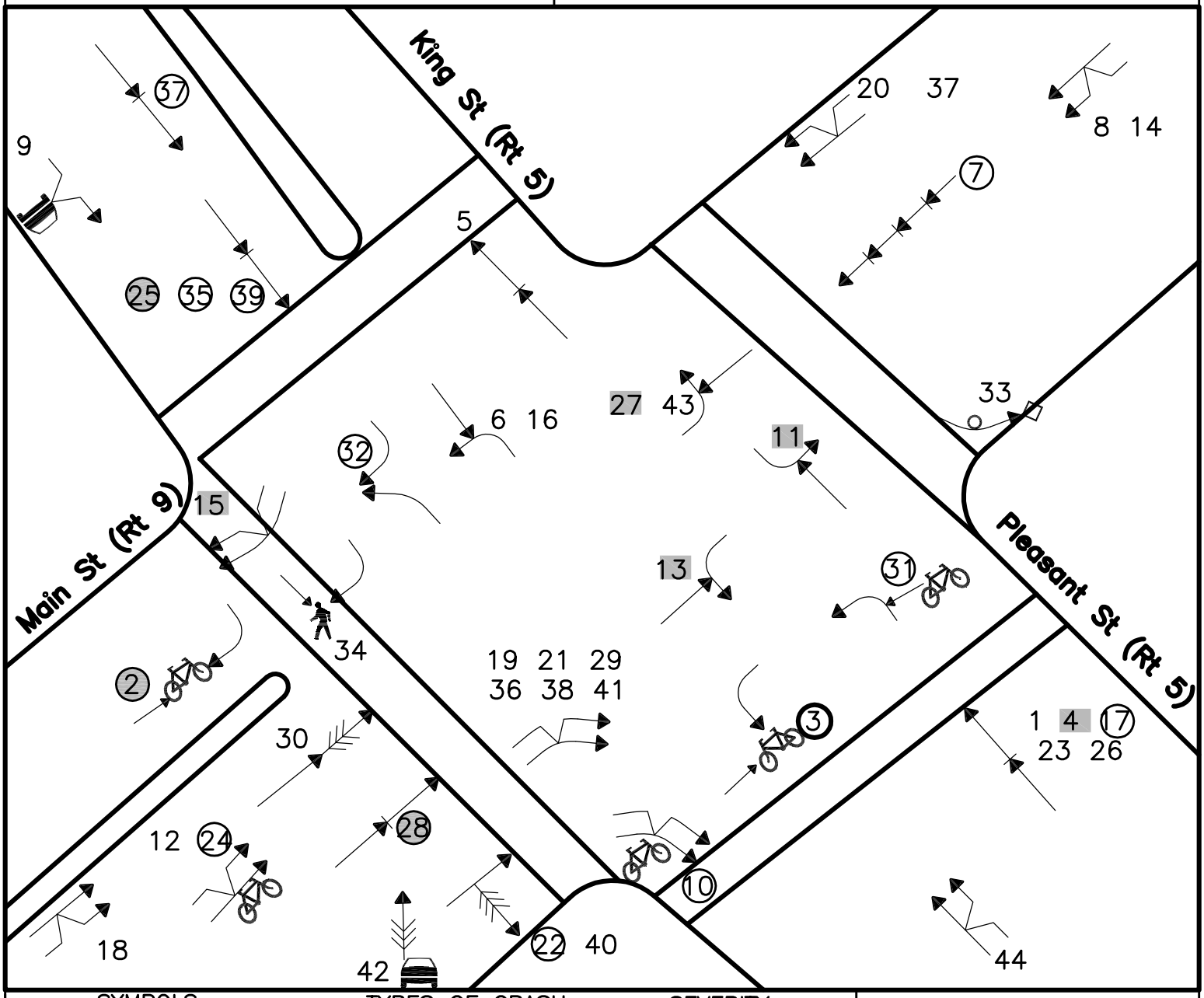
REGION: Pioneer Valley Planning Commission

MassDOT
Massachusetts Department of Transportation
Highway Division

COLLISION DIAGRAM

TIME PERIOD ANALYZED: Jan. 2012 – Aug. 2015
SOURCE OF CRASH REPORTS: Northampton Police Department
DATE PREPARED: 10/14/2015
PREPARED BY: William Ullom

*NOT TO SCALE



SYMBOLS

- Moving Vehicle
- Backing Vehicle
- Non–Involved Vehicle
- Pedestrian
- Bicycle
- Animal
- Parked Vehicle
- Fixed Object

TYPES OF CRASH

- Head on
- Rear End
- Angle
- Turning Movement
- Sideswipe
- Out of Control
- Night Time Crash

SEVERITY

- Injury
- Fatal

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Crash Data Summary Table

Main St at Pleasant St/King St, Northampton, MA

Jan. 2012 - Aug. 2015

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages				Comments
	m/d/y			*Type*	*Type*	*Type*	*Type*	*Type*	*D1*	*D2*	*D3*	*D4*	
1	2/6/12	Monday	11:03 AM	Rear-end	Daylight	Clear	Dry	No Improper Driving	28	44			MV1 and MV2 were stopped at red light in through lane. The left turn got a green arrow and MV1 misinterpreted this light as a solid ball and began to accelerate before braking quickly after realizing his mistake. MV2 also accelerated and hit MV1.
2	3/14/12	Wednesday	9:11 PM	Head on	Dark - lighted roadway	Clear	Dry	Failed to yield right of way	60	37			MV1 turned right and ran into an intoxicated cyclist heading the wrong way down Main St.
3	5/19/12	Saturday	7:11 PM	Single Vehicle Crash	Daylight	Clear	Dry	Inattention	43	18			Left turning motor vehicle failed to yield to oncoming cyclist. Cyclist suffered fatal injury.
4	5/25/12	Friday	9:45 PM	Rear-end	Dark - lighted roadway	Clear	Dry	Distracted	29	50			MV1 and MV2 stopped at red light. MV2 dropped their cell phone and took foot off the brake and rolled into MV1.
5	6/25/12	Monday	1:26 PM	Single Vehicle Crash	Dawn	Clear	Dry	Inattention	42	19			MV1 stopped in intersection for slow traffic ahead. MV2 was distracted by eating a pizza and did not see that MV1 had stopped.
6	6/29/12	Friday	12:42 PM	Angle	Daylight	Clear	Dry	Unknown	58	34			MV2, turning left, had green left arrow and began making maneuver. MV1 observed "some green light" and interpreted this as giving him right of way. MV1 then hits MV2.
7	7/14/12	Saturday	12:45 PM	Rear-end	Daylight	Clear	Dry	Inattention	20	70	75	29	MV2 through 4 stopped at red light. MV1 fails to notice stopped traffic and rear ends these vehicles.
8	7/17/12	Tuesday	4:13 PM	Angle	Daylight	Clear	Dry	No Improper Driving	24	51			Two vans abruptly stop in front of MV1 who slams on brakes and attempts to pull into right lane to avoid a collision and instead hits MV2.
9	11/2/12	Friday	5:33 PM	Sideswipe, same direction	Daylight	Clear	Dry	Other improper action	57	32			Driver of parked MV2 opened door into travel lane as MV1 was driving by, MV1 hit open door .
10	12/20/12	Thursday	1:25 PM	Angle	Daylight	Clear	Dry	Inattention		24			Both vehicle and bicycle attempted a right hand turn on red and the bike ran into MV1.
11	1/26/13	Saturday	2:09 AM	Sideswipe, opposite direction	Dark - lighted roadway	Snow	Wet	Made an improper turn	58	21			Both vehicles had green lights, but MV1, turning left, failed to yield to MV2, going through.
12	2/2/13	Saturday	1:57 PM	Sideswipe, same direction	Daylight	Cloudy	Dry	Unknown	45	23			Vehicle and bicyclist moved simultaneously into right turn lane. The bicyclist was hit by vehicle side mirror.
13	2/9/13	Saturday	5:49 PM	Angle	Dark - lighted roadway	Snow	Snow	No Improper Driving	29	54			Icy roads. MV2 attempted to make left turn without yielding to MV1, going through, MV2 accelerated and MV1 braked, they slid on ice and collided.
14	2/14/13	Thursday	3:21 PM	Angle	Daylight	Clear	Dry	Inattention	17	30			MV1, inadvertently in left turn only lane, changes lanes and hits MV2 in through lane.
15	2/19/13	Tuesday	5:37 PM	Sideswipe, same direction	Dark - lighted roadway	Rain	Snow	Inattention	26	52			MV1 pulled to the right for uninvolved emergency vehicle but upon pulling into travel lane, was struck by a second emergency vehicle.
16	2/27/13	Wednesday	10:29 PM	Head on	Daylight	Rain	Wet	Inattention	31	25			MV1, turning left, failed to yield to MV2, going straight.
17	4/7/13	Sunday	3:59 PM	Rear-end	Daylight	Clear	Dry	No Improper Driving	32	50			MV2 was stopped at red light. MV1 thought light was green and rear ended MV2.
18	4/27/13	Saturday	3:03 PM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention	29	57			MV1 was stuck in right lane behind vehicles attempting to park. She attempted to merge into left lane and hit the trailer of MV2.
19	9/23/13	Monday	1:28 PM	Sideswipe, same direction	Daylight	Clear	Dry	Made an improper turn	37	51			MV1 was in through lane, thought they were in the right turn lane. MV2 was in right turn lane and both attempted to turn at the same time.
20	10/7/13	Monday	3:40 PM	Sideswipe, opposite direction	Daylight	Rain	Wet	Inattention	84	71			MV1 attempted to reverse into a parallel parking spot. MV2 tried to pass MV1 on left but had to stop when it was parallel with MV1. As MV1 continued parking maneuver, it hit MV2.
21	10/20/13	Sunday	1:26 PM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention	61	23			Tractor Trailer in through lane was turning right at the same time as a vehicle in the right turn lane.
22	11/1/13	Friday	12:09 PM	Angle	Daylight	Rain	Wet	Inattention	64	40			MV1 was queued in traffic. MV2 was backing out of angled parking and did not see MV1 behind her.
23	11/9/13	Saturday	10:29 AM	Rear-end	Daylight	Cloudy	Dry	Inattention	16	38			A vehicle and tractor trailer were stopped at a red light, but the tractor trailer had pulled too far ahead. He lost track of where the vehicle in front of him was. When the light turn green the tractor trailer began to move forward before the vehicle and rear ended it.
24	11/23/13	Saturday	12:54 PM	Sideswipe, same direction	Daylight	Clear	Dry	No Improper Driving	38	25			MV1 began to merge from thru lane into right turn lane. Bicyclists was on right hand side of car and hit car.
25	12/4/13	Wednesday	6:03 PM	Rear-end	Dark - lighted roadway	Clear	Dry	No Improper Driving	48	27			MV1 and MV2 were stopped at red light. MV1 began to proceed prior to green light and rear ended MV2.
26	1/13/14	Monday	4:12 PM	Rear-end	Daylight	Clear	Dry	Inattention	57	49			MV2 stopped at red light; MV1 was not looking at road and did not notice MV2 had stopped.
27	2/11/14	Tuesday	9:06 PM	Angle	Dark - lighted roadway	Clear	Dry	Inattention	63	29			MV2, turning left, failed to yield to MV1 as light turned to the permissive phase, going through, in the oncoming lane.
28	3/15/14	Saturday	9:12 PM	Rear-end	Dark - lighted roadway	Clear	Dry	Inattention	29	41			MV2 stopped at red light; MV1 was distracted and then rearenended MV2.
29	3/25/14	Tuesday	8:03 AM	Sideswipe, same direction	Daylight	Clear	Dry	Made an improper turn	56	32			MV1 was in through lane. MV2 was in right turn lane and both attempted to turn right at the same time.

Crash Data Summary Table

Main St at Pleasant St/King St, Northampton, MA

Jan. 2012 - Aug. 2015

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages				Comments
	m/d/y			*Type*	*Type*	*Type*	*Type*	*Type*	*D1*	*D2*	*D3*	*D4*	
30	3/30/14	Sunday	10:54 AM	Rear-end	Daylight	Rain	Wet	Inattention	50	74			MV1 stopped at red light in crosswalk. MV1 then reversed into MV2, stopped behind them.
31	4/7/14	Monday	8:59 AM	Angle	Daylight	Cloudy	Dry	No Improper Driving	32	24			Vehicle had green left arrow and was making turn when hit by bicyclists who ran red light (perhaps bicycle was going the wrong way in EB lane) to"beat all traffic."
32	4/12/14	Saturday	10:02 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way	81	27			MV1, turning left, failed to yield to MV2, turning right.
33	7/22/14	Tuesday	11:28 AM	Single Vehicle Crash	Daylight	Clear	Dry	Unknown	70				Driver cannot remember what happened after she started turning.
34	10/25/14	Saturday	11:28 AM	Single Vehicle Crash	Daylight	Clear	Dry	Inattention	23	57			Driver was turning right on green light when a pedestrian stepped in front of them.
35	11/11/14	Tuesday	2:30 PM	Rear-end	Daylight	Clear	Dry	Inattention	64	28			MV1 was stopped at red light. MV2 was coming up from behind. Light turned green and MV1 had yet to start moving forward when MV2 rear ends them.
36	12/2/14	Tuesday	1:13 PM	Angle	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	56	57			MV1 was in through lane. MV2 was in right turn lane and both attempted to turn right at the same time. MV1 thought right lane was for parking.
37	2/20/15	Friday	4:57 PM	Angle	Daylight	Clear	Dry	Failure to keep in proper lane or running off road	20	59			MV1 attempted to move from parking space to left most lane and did not see that it was occupied by MV2.
38	4/21/15	Tuesday	5:37 PM	Angle	Daylight	Clear	Dry	Inattention	37	22			Box truck was making right turn from left side of right turn lane. Motor vehicle attempted to squeeze past on the right to make right turn and the two vehicles collided while turning.
39	4/24/15	Friday	4:52 PM	Rear-end	Daylight	Clear	Dry	No Improper Driving	54	23			MV2 was stopped at red light. MV1 did not stop soon enough and rear ended MV2.
40	5/10/15	Sunday	3:36 PM	Angle	Daylight	Clear	Dry	Inattention	71	17			MV1 reversed out of a parking spot into MV2.
41	5/26/15	Tuesday	8:20 AM	Sideswipe, same direction	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	31	73			MV1 was in through lane, thought they were in the right turn lane. MV2 was in right turn lane and both attempted to turn at the same time.
42	6/11/15	Thursday	12:22 PM	Sideswipe, same direction	Daylight	Clear	Dry	Other improper action	39	63			While attempting to reverse into a parallel parking spot, MV1 hit MV2, parked in spot ahead.
43	7/4/15	Saturday	10:40 AM	Angle	Daylight	Cloudy	Dry	Failed to yield right of way	39	27			MV1, turning left, failed to yield to MV2, turning right.
44	7/13/15	Monday	3:59 PM	Sideswipe, same direction	Daylight	Clear	Dry	Failed to yield right of way	28	23			MV1 attempted to change to the left lane from the through lane and did not see MV2 occupying the left lane.

Summary based on Crash Reports obtained from the Northampton Police Department

MassDOT
Massachusetts Department of Transportation
Highway Division

COLLISION DIAGRAM

SYMBOLS	TYPE OF CRASH	SEVERITY
Moving Vehicle	Head on	
Backing Vehicle	Rear End	Injury
Non–Involved Vehicle	Angle	
Pedestrian	Turning Movement	Fatal
Bicycle	Sideswipe	
Animal	Out of Control	
Parked Vehicle	Night Time Crash	
Fixed Object		

Northampton, MA

Main St at Strong Ave

REGION: Pioneer Valley Planning Commission

TIME PERIOD ANALYZED: Jan. 2012 – Aug. 2015
SOURCE OF CRASH REPORTS: Northampton Police Department
DATE PREPARED: 10/15/2015
PREPARED BY: William Ullom

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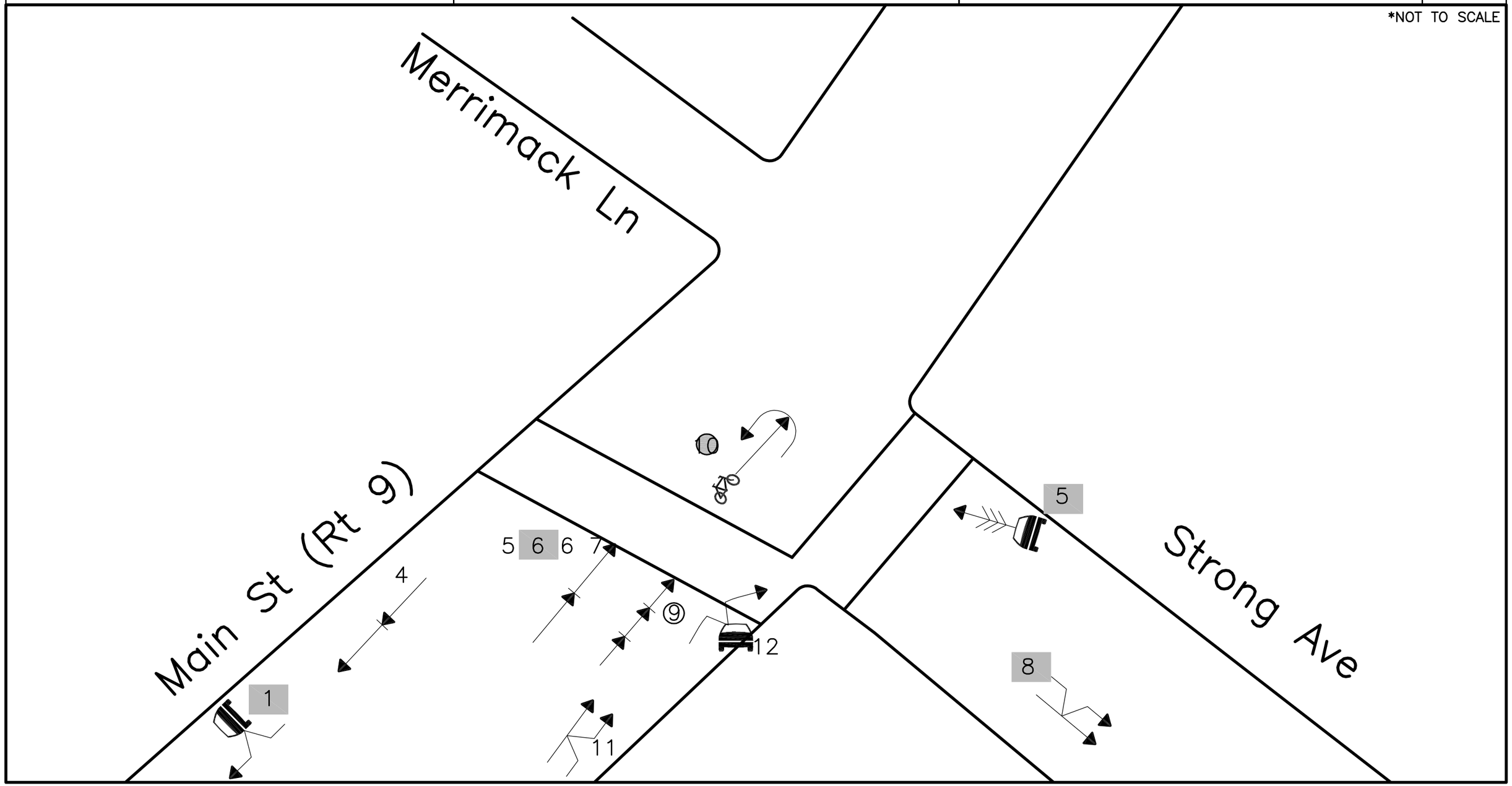
*NOT TO SCALE



Crash Data Summary Table

Main St at Strong Ave, Northampton, MA

Jan. 2012 - Aug. 2015

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages			Comments
	m/d/y			*Type*	*Type*	*Type*	*Type*	*Type*	*D1*	*D2*	*D3*	
1	1/24/12	Tuesday	7:34 PM	Sideswipe, same direction	Dark - lighted roadway	Cloudy	Wet	Inattention	43			MV1 crashed into parked MV2 while attempting to parallel park.
2	9/29/12	Saturday	11:40 AM	Rear-end	Daylight	Cloudy	Wet	Inattention	65	25		MV1 stopped for a vehicle and was rear ended bt MV2.
3	11/24/12	Saturday	2:14 AM	Rear-end	Dark - lighted roadway	Rain	Wet	Inattention	24	32		MV2 stopped for pedestrian in crosswalk. MV1, distracted by tuning radio, rear ends MV2.
4	1/5/13	Saturday	4:07 PM	Rear-end	Daylight	Clear	Wet	Distracted	20	21		MV2 stopped in traffic. MV1 did not stop in time and rear ended MV2..
5	1/15/13	Tuesday	5:56 PM	Sideswipe, same direction	Dawn	Clear	Dry	Inattention	30			Tractor trailer was backing up to turn around because of low bridge clearance ahead. During the process, Tractor Trailer hit a legally parked vehicle.
6	6/5/13	Wednesday	7:16 PM	Rear-end	Daylight	Clear	Dry	Inattention	17	24		MV2 was stopped in the travel lane. MV1 was not paying attention and did not stop in time and rear ends MV2.
7	6/26/13	Wednesday	1:14 PM	Rear-end	Daylight	Clear	Dry	Distracted	55	62		MV1 stopped for pedestrian in crosswalk. MV2 did not stop in time and rear ends MV1.
8	7/25/13	Thursday	21:37	Sideswipe, same direction	Dusk	Clear	Dry	Inattention	49	44		MV2 was waiting for parking spot along Strong Ave when MV1 attempted to pass on the left, hitting MV2.
9	11/29/13	Friday	10:54 AM	Rear-end	Daylight	Clear	Dry	Inattention	76	65	33	MV1 and MV2 were stopped at crosswalk. MV3 was not paying attention to the road and rear ended MV1 and 2.
10	7/9/14	Wednesday	12:36 AM	Single Vehicle Crash	Dark - lighted roadway	Rain	Wet	Inattention	29	23		Bicycle traveling to left of vehicle on Main St (single lane). Livery vehicle made U-turn to pick up fare on opposite sife of street and the bicycle ran into the left front end of the vehicle.
11	10/18/14	Saturday	9:20 AM	Angle	Daylight	Cloudy	Dry	Inattention	19	36		MV1 attempted to pull out of a parallel parking spot and hit MV2, travelling I adjacent lane.
12	4/12/15	Sunday	11:10 AM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention	31			Vehicle made right turn too soon and clipped a parked car.

Summary based on Crash Reports obtained from the Northampton Police Department

Northampton, MA

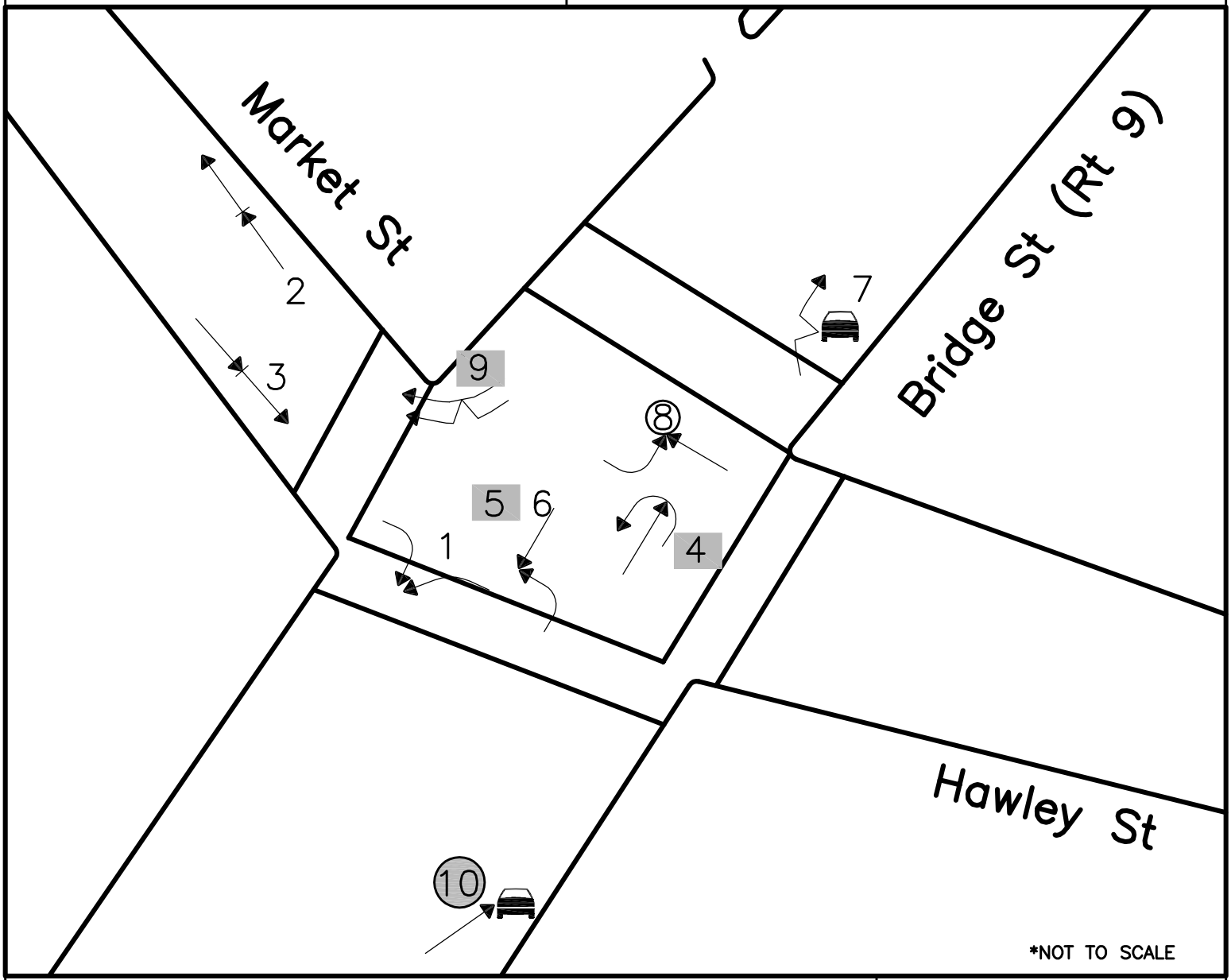
Bridge St (Rt 9) at Market St/Hawley St

REGION: Pioneer Valley Planning Commission

massDOT Massachusetts Department of Transportation Highway Division

COLLISION DIAGRAM

TIME PERIOD ANALYZED: Jan. 2012 – Aug. 2015
SOURCE OF CRASH REPORTS: Northampton Police Department
DATE PREPARED: 10/9/2015
PREPARED BY: William Ullom



SYMBOLS

- Moving Vehicle
- Backing Vehicle
- Non–Involved Vehicle
- Pedestrian
- Bicycle
- Animal
- Parked Vehicle
- Fixed Object

TYPES OF CRASH

- Head on
- Rear End
- Angle
- Turning Movement
- Sideswipe
- Out of Control
- Night Time Crash

SEVERITY

- Injury
- Fatal

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Crash Data Summary Table

Bridge St at Market St/Hawley St , Northampton, MA

Jan. 2012-Aug. 2015

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages		Comments
	m/d/y			*Type*	*Type*	*Type*	*Type*	*Type*	*D1*	*D2*	
1	5/4/12	Friday	10:46 AM	Angle	Daylight	Cloudy	Wet	Failed to yield right of way	61	53	While making a left turn, MV1 failed to yield to MV2, turning right.
2	5/7/12	Monday	5:00 PM	Rear-end	Daylight	Clear	Dry	Inattention	56	21	MV1 stopped, waiting for a vehicle to park. MV2 did not notice this and rearended MV1.
3	9/14/12	Friday	6:52 PM	Rear-end	Daylight	Clear	Dry	Inattention	23	44	MV2 stopped at red light to turn right. MV1, not paying attention, rear ends MV2.
4	11/21/12	Wednesday	10:55 PM	Angle	Dark - lighted roadway	Clear	Dry	Inattention	23	23	MV1 attempted a U-turn and was hit by following vehicle.
5	1/10/13	Thursday	5:20 PM	Sideswipe, opposite direction	Dark - lighted roadway	Clear	Dry	No Improper Driving		67	MV2 failed to yield to oncoming traffic while making a left turn. Hit by MV1.
6	3/20/14	Thursday	5:32 PM	Head on	Daylight	Rain	Wet	Other improper action	51	46	Both vehicles had left turn signal on. MV1 made left turn but MV2 went thru.
7	4/22/14	Tuesday	2:55 PM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention	32		Tractor Trailer failed to negotiate right turn properly and hit parked car.
8	6/13/14	Friday	2:12 PM	Head on	Daylight	Rain	Wet	Inattention	24	70	MV1 failled to yield to oncoming MV2 while making left turn.
9	12/13/14	Saturday	7:11 PM	Sideswipe, same direction	Dark - lighted roadway	Clear	Dry	Unknown	62	30	Two vehicles attempted to make a right turn from a one lane road to a one lane road.
10	2/18/15	Wednesday	12:15 AM	Rear-end	Dark, unknown roadway lighting	Clear	Dry	Operating Vehicle in erratic, reckless, careless, negligent, or aggressive manner	21	47	MV1 hit parked MV2.

Summary based on Crash Reports obtained from the Northampton Police Department